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DISTRIBUTION OF RECOVERIES FROM BANDINGS OF DUCKLINGS

SPECIAL SCIENTIFIC REPORT--WILDLIFE No. 89

UNITED STATES DEPARTMENT OF THE INTERIOR
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ERRATA

p. 142. Figure 15 should read - Direct recoveries of local mallards from bandings in Colorado.

p. 143. Figure 16 should read - Direct recoveries of local mallards from bandings in Nebraska.

p. 144. Figure 17 should read - Direct recoveries of local mallards from bandings in Minnesota.

p. 127. Table 47 - Southwestern Saskatchewan - Delete "0" and add "-" under column heading 1961.

North Dakota - Delete "0" and add "-" under column heading 1960.

South Dakota - Delete "0" and add "-" under column headings 1958-61.

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ABSTRACT

This report presents the recovery distributions of 10 species of game ducks banded as flightless young on the breeding grounds. Conclusions are based on 20,152 direct or first year band recoveries, 9,272 of which are of mallards. The recovery distributions of these ducks by State and Flyway, or country, of recovery from breeding ground aerial survey strata or State of banding are presented. In addition, mallard recoveries from bandings grouped by geographical region are presented to show distribution variations attributable to region, year of banding, sex, first year versus later years of recovery, weather, etc. Recovery rates of mallards banded as flightless young and the affects of various factors on recovery rates are discussed.

DISTRIBUTION OF RECOVERIES FROM BANDINGS OF DUCKLINGS

This is the second progress report on the cooperative program to band ducklings on the waterfowl breeding grounds. The first was prepared in 1957 by Seth Low (Waterfowl Banding in the Canadian Prairie Provinces, Special Scientific Report--Wildlife No. 36).

Flyway management of migratory waterfowl in the United States was initiated in 1947. Research to develop methods of conducting breeding ground surveys was begun in the same year. Aerial censuses of the breeding population were operational by 1951, but it became evident that the data were difficult to use for forecasting changes in fall flights in the flyways. The primary problem was lack of knowledge about the relation between population changes in various units of the breeding range and the harvest of birds in each of the flyways.

Banding was the obvious solution, but decisions had to be made about the type of birds to be banded. The choices included molters, flying young and adults caught immediately before the shooting season, and "locals" (immature birds not old enough to fly). Since both molters and flying birds move in late summer into concentration areas from unknown distances and directions, it was concluded they might not be representative of the populations recorded within specific breeding areas by the aerial survey crews. On the other hand, it was obvious that young birds before reaching flying age were definitely associated with these areas. Therefore, an expanded banding program was initiated in 1954 with emphasis on the banding of "locals."

Since the first progress report was prepared in 1957, portions of the program have been essentially completed. This is true for mallards in the southern parts of the Prairie Provinces. However, much mallard banding remains to be done, particularly in northern Canada and in the United States. Owing to the varying degree of completion of the program by species and area, this report is in two parts. The first part presents the distribution of direct (first hunting season) recoveries of the 10 duck species banded as locals that are most important to hunters. This part has been organized to show the relation between the aerial breeding ground survey strata and the flyway of recovery, and between the State or Province of banding and the State or Province and flyway of recovery.

The second part, by reason of the greater number and better distribution of the mallard locals that have been banded, discusses in more detail the recoveries from these bandings. The data presented include both first season recoveries (direct) and those from subsequent years (indirect). Also, in this part neither aerial survey strata

nor political subdivisions have been used to describe the breeding ground origin of the birds; rather, the distribution patterns from various banding locations were examined and those with similar characteristics were combined into single units termed "areas of reference." This was done to examine the effect on distribution of such factors as weather, shooting regulations, and yearly variations in migration.

DATA INCLUDED

Band recoveries used in this report include only those from wild ducklings captured in traps, by hand, or with the use of dogs, and banded in a normal manner. Recoveries were further limited to those of ducks that were shot or found dead between September 1 and February 29. Except for a few tables where yearly variation is examined, data from all years of banding are combined. Thus they reflect a more or less average distribution of the harvest of immature ducks in periods of both high and low populations and liberal and restrictive seasons and bag limits. It should be recognized, however, that the number of ducks banded was larger for many species during the period of high populations in the mid 1950's. In some cases this produces results more representative of a period of high populations and liberal regulations. Further, the distribution of banding effort did not agree particularly well with the distribution of the breeding population. Thus, many ducklings have been banded in the Prairie pothole region, but few or none have been banded in the important production areas of northern Canada (fig. 1).

The number of recoveries of each species summarized in this report are as follows:

Mallard	9,272
Gadwall	981
American widgeon	1,282
Green-winged teal	74
Blue-winged teal	1,884
Shoveler	951
Pintail	1,859
Redhead	2,081
Canvasback	609
Lesser scaup	1,159

It should be noted that these are the maximum numbers of recoveries used in any of the tables. Numbers used in individual tables may be less for various reasons. For example, both direct and indirect recoveries were used in some of the mallard tables whereas only direct

recoveries were used in other tables; other reasons are indefinite location codes and elimination of percent distribution determinations from States or Provinces with bandings which resulted in less than 10 recoveries.

As yet, no species is adequately represented by bandings of "locals" over all of its breeding range, and others, such as the green-winged teal, are not adequately represented in any location.

PART 1--DISTRIBUTION OF DIRECT RECOVERIES OF TEN SPECIES

Method of Analysis

Recoveries were first grouped on the basis of the production area from which they were derived. So that the data would be most useful, two different groupings of banding locations were used in summarizing data in this section of the report. First, the banding locations were grouped according to strata into which duck breeding areas are divided for aerial census (fig. 2). Distribution of banded duck recoveries in the four flyways is presented in tables 1 through 10.

The second grouping of banding locations was by States and Provinces. In tables 11 through 19 this grouping is related to State, Province, and flyway of recovery. Some production areas are not assigned to aerial census strata; recoveries from bandings in these areas may be examined in the analysis of distribution from States and Provinces.

Results

Mallards

The most significant feature of the distribution of mallard recoveries was the high percentage of recoveries in Canada from bandings in Canada and Alaska. This ranged from more than 40 percent of recoveries from ducks banded in Alaska and Saskatchewan to 56 percent in Alberta and 63 percent in British Columbia (tables 1 and 11).

Adjacent production areas usually had similar harvest patterns, and there was only a gradual shifting of harvest east or west corresponding to the location of the area of production.

Recoveries within the contiguous States of mallards banded in Alaska were almost exclusively in the Pacific Flyway. Almost half of the recoveries within the United States from bandings in Alberta were in the Pacific Flyway with the remainder about equally divided

between the Central and Mississippi Flyways. More than half of the recoveries in the United States from bandings in Saskatchewan were in the Mississippi Flyway, about a third were in the Central Flyway, and only a few were in the Pacific and Atlantic Flyways.

The distribution of recoveries from bandings in the Prairie Provinces suggested that along any given longitude ducks produced farther north tended to be harvested farther to the east than ducks produced farther south. This was illustrated by a comparison of Alberta strata 27 and 28; Saskatchewan strata 21 and 23; and Saskatchewan strata 22 and 20 (fig. 1 and table 1). In each case, the proportion of recoveries from the northern stratum was highest in the Mississippi Flyway and lowest in the Central and Pacific Flyways.

Recoveries from bandings within the United States indicated that more than half of the ducks produced in the various States were harvested in the State of origin and that more than 90 percent were harvested in the flyway of origin. In the Pacific Flyway more than 90 percent of the recoveries were in the State of banding and for all practical purposes, recoveries may be considered to have occurred entirely within the Flyway. Only the Central Flyway States of North and South Dakota contributed a significant number of mallards to the harvest in another flyway.

Gadwalls

Recoveries from only a few scattered banding locations were available for gadwalls (tables 2 and 12). Distribution from bandings in California, Oregon, and Washington show that most of the kill of birds produced in these areas was in the Pacific Flyway. Almost half of the recoveries from bandings in Alberta were in Canada, but of those in the United States, about half were in the Central Flyway and the remainder were divided between the Mississippi and Pacific Flyways. Gadwalls from Saskatchewan contributed very little to the harvest in the Pacific Flyway. Birds from this Province, together with those from the Dakotas, contributed primarily to the kill in the Central and Mississippi Flyways. Manitoba and Minnesota supplied birds mostly to the Mississippi Flyway although a significant proportion (39 percent and 18 percent) of birds produced in both areas was shot in Canada. A few gadwalls were recovered south of the United States, but Latin American harvest areas were important only for gadwalls banded in Nebraska (13 percent) and Utah (10 percent). Recoveries from bandings in Saskatchewan, Manitoba, and the Dakotas were scattered from Maryland to Florida in the Atlantic Flyway, but in each locality the number of recoveries was small and did not point to any clear pattern of entry into the Flyway.

American widgeons

Recoveries of banded widgeons were more evenly distributed among the flyways than were those of any other species. The proportion of recoveries in Canada from widgeons banded in Alaska and Canada varied from 19 percent from British Columbia bandings to 25 percent from Manitoba bandings. Hunters in Mexico and other countries to the south of the United States accounted for 1 to 10 percent of the recoveries of widgeons from bandings in most areas (tables 3 and 13). Most widgeons from Alaska, British Columbia, and Alberta that were shot in the United States were harvested in the Pacific Flyway. Widgeons from Saskatchewan were recovered nearly equally by hunters in the Mississippi, Central, and Pacific Flyways, but those from Manitoba were taken mostly by hunters in the Mississippi Flyway. An important proportion of widgeons banded in Saskatchewan, Manitoba and Minnesota (9 to 16 percent) was recovered in the Atlantic Flyway.

Green-winged teals

Recoveries of banded green-winged teals were too few to determine their distribution from various strata. The distribution of recoveries from bandings in Alaska, Northwest Territories, Alberta and Saskatchewan is summarized in table 4. Recoveries from bandings in Alaska were primarily in the Pacific Flyway. About half of the recoveries from bandings in both Alberta and Saskatchewan were in the Central Flyway but recoveries in the Mississippi Flyway became relatively more important from bandings in Saskatchewan.

Blue-winged teals

The distribution of recoveries of blue-winged teals is summarized in tables 5 and 14. Harvest of blue-winged teals within the United States was principally within the Mississippi and Central Flyways. Recoveries within the United States of blue-wings that were banded in British Columbia were entirely in States of the Pacific Flyway, but with the exception of southern Alberta (stratum 26), there were no recoveries in the Pacific Flyway from bandings in the Prairie States and Provinces. However, all strata, except west-central Saskatchewan (21) and southwestern North Dakota (31) where samples were small, had a small percentage of recoveries in the Atlantic Flyway. The proportion of recoveries in Canada from bandings within Canada varied from about a third to a half of total recoveries, being highest in Alberta strata 26 and 27. Recoveries south of the United States varied from 8.3 percent of birds banded in North Dakota stratum 31, to 33.3 percent of those banded in Saskatchewan stratum 19; they were generally higher for blue-wings banded in Alberta and western Saskatchewan than for those banded in strata to the east. The decreased proportion of recoveries in Canada and south of the United States from birds banded in strata in eastern Saskatchewan and Manitoba probably reflects a high vulnerability of blue-wings to Mississippi Flyway hunters, because first

hunting season recovery rates for immatures change from 2.8 percent in Alberta to 4 percent in Manitoba (Migratory Bird Populations Station Administrative Report 18).

Recoveries of blue-winged teals banded within the United States were chiefly within the Central and Mississippi Flyways, and the proportion of these recoveries occurring south of the United States was less than that derived from Canadian bandings. Recoveries tended to be concentrated within the State of banding, but more birds banded in Nebraska and North Dakota and nearly as many banded in South Dakota were harvested in Minnesota than in the State of banding.

Shovelers

The distribution of recoveries of banded shovelers was oriented toward the western flyways (tables 6 and 15). Shovelers banded in Alaska, British Columbia, Washington, and California that were recovered in the United States have all been taken in the Pacific Flyway. Approximately 85 percent of United States recoveries from bandings in Alberta were in the Pacific Flyway but this proportion diminished to about a third of the recoveries from bandings in Saskatchewan. Both Saskatchewan and Manitoba shovelers contributed primarily to the kill in the Central Flyway. Harvest of shovelers from the Prairie Provinces in the Mississippi Flyway was relatively low, varying from only 4 percent of recoveries from Alberta bandings to 11 percent from Saskatchewan and 28 percent from Manitoba. However, hunters in the Mississippi Flyway shot approximately 37 percent of the shovelers banded in South Dakota and 41 percent from North Dakota.

Pintails

Hunters in the Pacific Flyway shot more banded pintails from Alaska and Canadian Provinces east through Saskatchewan than did hunters in any other flyway (tables 7 and 16). Recoveries of pintails in the Central and Mississippi Flyways from bandings in all Prairie States and Provinces except Minnesota indicated that a larger proportion of prairie raised pintails was shot in the Central than the Mississippi Flyway. Recoveries from bandings in the Prairie States were widely scattered throughout the Central and Mississippi Flyways but were consistently most numerous in the State of banding. Birds taken away from the State of banding were slightly more frequently shot in Minnesota, Louisiana, and Texas than in other States. The few pintails taken in the Atlantic Flyway originated mostly in Manitoba, the Dakotas, and Minnesota.

Canadian hunters took a smaller portion of pintails than mallards, varying from 13 percent of total recoveries from bandings in British Columbia to 36 percent in Manitoba. A small proportion of recoveries from bandings in most States and Provinces was in countries to the south of the United States.

Redheads

The distribution of banding effort for redheads differed from that for other species in that most banded populations were in the United States rather than in the Canadian Prairie Provinces. Approximately 70 percent of recoveries were from bandings in California, Minnesota, Nevada, and Utah, and less than 20 percent were from bandings in Canada (tables 8 and 17).

Despite the southern distribution of bandings, recoveries were widespread compared with the distribution of other species. Redhead bandings in British Columbia, California, Utah, and Nevada have produced more recoveries in the Central Flyway (6 to 15 percent) than for other species. The tendency toward an eastward distribution of recoveries was apparent also from bandings in Alberta. Although most species in Alberta were strongly oriented toward the Pacific Flyway, only 4 percent of the Alberta redheads were recovered in the Pacific Flyway and 50 percent were taken in the Central and Mississippi Flyways. No redheads banded in Saskatchewan have been recovered in the Pacific Flyway. Redheads were taken in all States of the Central and Mississippi Flyways, but hunters in Texas, Minnesota, and Michigan shot a much larger proportion of banded redheads than did hunters in other States.

Canvasbacks

The kill pattern of canvasbacks showed a wide distribution of birds from all production areas (tables 9 and 18). Most canvasbacks produced in Alaska were shot in the Pacific Flyway but an important segment (6 percent) was also taken in the Atlantic Flyway. None banded in Alaska were shot in the Central or Mississippi Flyways. The recovery distribution of canvasbacks from British Columbia was almost identical to that from Alaska. The proportion of canvasbacks from Alberta that was recovered in the Atlantic Flyway was similar to that for Alaska and British Columbia, but an important segment of the recoveries from Alberta bandings (20 percent) was in the Central and Mississippi Flyways. The proportion of recoveries in the Atlantic, Central, and Mississippi Flyways continued to increase for bandings eastward from Alberta, approximately corresponding to a decrease of recoveries in the Pacific Flyway. Bandings in Manitoba, the Dakotas, and Minnesota have produced no recoveries in the Pacific Flyway, but these areas contributed substantially to the harvest in the Atlantic Flyway.

The proportion of recoveries in Canada from canvasbacks banded in Canada was relatively high, varying from 16 percent for those banded in British Columbia to 40 percent for those banded in Manitoba. Relatively few banded canvasbacks have been shot in countries south of the United States.

Lesser scaups

Recoveries of lesser scaups from various banding areas indicate distributions of kill that were different from most other species in that they occurred over a broad area (tables 10 and 19). Recoveries within the United States from bandings in Alaska were almost equally divided among the three western Flyways, with 6 percent in the Atlantic Flyway. Most recoveries from bandings in British Columbia were in the Pacific Flyway, but only 9 percent of recoveries from bandings in Alberta occurred there. Alberta and Saskatchewan contributed primarily to the kill in the Central and Mississippi Flyways with largest numbers being shot in Minnesota, Louisiana, and Texas.

All recoveries in the Atlantic Flyway originated from bandings north of the United States. The proportion of recoveries in the Atlantic Flyway was not large for any banding area, with a maximum of about 7 percent from bandings in Saskatchewan and Mackenzie. Northernmost recoveries in the Atlantic Flyway were in New York, but most were from southern portions of the Flyway with those from Florida exceeding the total in other States.

Discussion

The geographical distribution of recoveries of the various species of waterfowl reveal broadly similar aspects. These include the gradual east to west shifting of recoveries corresponding to similar shifting of the banding location, and the concentration of recoveries in the State, Province or flyway of banding. Generally, the distribution of recoveries of dabbling ducks had more similarity to each other than they did to diving ducks. However, the distributions of recoveries reveal many marked differences between species, particularly in the proportions of recoveries that occurred in the different flyways, in Canada, and in countries to the south of the United States. These differences strongly reflect fundamental differences in migration routes and wintering areas. However, it must be remembered that a band recovery represents a bird shot. Thus, regional variation in the vulnerability of a species to shooting may bias estimates of the size of populations that migrate to various wintering areas. Factors that affect vulnerability to shooting include timing of migration, the desirability of a species as compared to other species available to hunters in a given region, and variation in hunting pressure.

The gradual shifting west or east of the kill with corresponding changes in the location of banding is best illustrated by recoveries

of mallards banded in the southern tier of Canadian Provinces and recovered in the various flyways as indicated below:

Province of banding	Percent recovered in-- Pacific Flyway	Central Flyway	Mississippi Flyway	Atlantic Flyway
British Columbia	98	0	2	0
Alberta	25	63	11	1
Saskatchewan	5	33	59	3
Manitoba	0	24	71	5

The distribution of recoveries of pintails, shovelers, and widgeons indicates a much stronger orientation to western flyways than the other species. Thus, 86 percent of recoveries of pintails and shovelers banded in Alberta and 80 percent of the widgeon recoveries from bandings in the same area were in the Pacific Flyway. Approximately 60 percent of immature pintails from Saskatchewan and 26 percent from as far east as Manitoba were shot in the Pacific Flyway. The canvasback is the most oriented toward the Pacific Flyway of the divers; 58 percent of canvasback recoveries from Alberta and 10 percent from Saskatchewan occurred there. However, a large number of canvasbacks was killed in the Atlantic Flyway, the proportion from most banding regions exceeded that for any other species. Similarly, a larger proportion of widgeons was taken in both the Atlantic and Pacific Flyways as compared with the blue-winged teal or mallard.

The transition between a kill pattern oriented primarily toward the Pacific Flyway and one oriented to the Central and Mississippi Flyways is abrupt for blue-winged teals, scaups, and redheads. All blue-winged teals, 91 percent of scaups and 74 percent of redheads banded in British Columbia were recovered in the Pacific Flyway, but respectively only 5, 9, and 7 percent of those banded in Alberta were recovered there. Bandings of these species in Saskatchewan and Manitoba rarely produced recoveries in the Pacific Flyway.

The Canadian waterfowl harvest accounts for a large portion of the total recoveries of most species from bandings in Canada and Alaska and for a significant but much smaller proportion of recoveries from bandings in the United States. The unweighted average of recoveries for the various Provinces indicated that approximately 55 percent of the total harvest of immature mallards produced in Canada occurred in Canada. The average proportion of recoveries in Canada from bandings in Canada was 43 percent for redheads, 41 percent for blue-winged teals, 31 percent for canvasbacks, and between 20 and 30 percent for other species. The unweighted average proportion of the harvest occurring in Canada for all species was 27 percent for bandings in Saskatchewan, 34 percent for Alberta, 35 percent for British Columbia, and 37 percent for Manitoba. However, these percentages apply to

immature ducks which are highly vulnerable to hunting in the vicinity of the banding station, and the proportion of recoveries of adult waterfowl occurring in Canada was smaller.

The proportion of recoveries occurring south of the United States was relatively small for most banding regions and most species. The proportion of recoveries of ducks banded in Alaska and Canada that occurred in countries south of the United States was more consistent and usually larger than the proportion of recoveries from bandings in the United States. The percentage of blue-winged teals killed in regions south of the United States was more than 5 times as large as that for any other species, averaging 24 percent of recoveries from Canadian bandings and about 18 percent from bandings in the United States.

The distribution of recoveries suggests locations of migration routes, but such data must be treated with caution because variations in timing of migration, hunting pressure, and other factors may influence the proportion of birds killed to those present in a given location. Mallards from the Prairie Provinces appeared to move on a broad front diagonally to the southeast through the Central to the Mississippi Flyway. Blue-winged teals may follow a somewhat similar route although perhaps in a more easterly direction as indicated by the relatively greater number of recoveries in the Dakotas and Minnesota than for the mallards. Pintails and shovelers appeared to move more directly south or southwest, thus producing more recoveries in the Central and Pacific Flyways.

Recoveries from bandings near the southern edge of the breeding range indicate that movement from these regions can be best characterized as a random movement in all directions subject to available habitat. Most recoveries were from the general region of banding, but the scattering of other recoveries usually obscured any migratory pattern that may exist. Ducks from the prairie regions of the United States and Canada appeared to migrate to the Atlantic Flyway by three distinct routes. Canvasbacks, lesser scaups, and widgeons move through the region of the Great Lakes to New York and then south through Pennsylvania to Chesapeake Bay. Further movement south to as far as North Carolina is probably coastal. Mallards from North Dakota, Minnesota, and other regions adjacent to the Great Lakes enter the Atlantic Flyway via the Great Lakes route. However, recoveries in the Atlantic Flyway from mallards banded in western Manitoba and in Saskatchewan were mostly in the Carolinas, Georgia, and Florida. The frequency of recoveries in Tennessee from western Manitoba and Saskatchewan suggested that mallards in the southern end of the Atlantic Flyway reach there via the Tennessee River Valley. The frequency of recoveries in Florida, particularly from those regions where other recoveries in the Atlantic were lacking, suggests that a few ducks of most species reach Florida by moving eastward along the Gulf Coast. Thus, all routes used by interior ducks to reach the Atlantic Flyway as well as the distribution of recoveries within the Flyway, indicate

that the prairie regions contribute primarily to the kill in the central and southern portions of the Atlantic Flyway. The prairie regions do not appear to contribute significantly to the waterfowl harvest in the New England States.

PART 2--DISTRIBUTION OF RECOVERIES FROM MALLARDS BANDED AS LOCALS

The mallard is by far the most important species of waterfowl in North America, making up nearly 50 percent of the total duck harvest in an average year. The importance of this species was recognized when the current program to band locals was first organized. The southern portion of the Prairie Provinces is composed of approximately 80 one-degree blocks of latitude and longitude. Within this area, the objective was to band a sufficient number of mallard locals to obtain 30 direct recoveries from each one degree block of latitude and longitude. With certain exceptions, this banding was to be accomplished gradually over a period of 5 years. The purpose was to obtain an average measure of distribution under a variety of conditions. Exceptions were made in several areas where it was feasible to band large numbers of birds annually. The purpose here was to determine annual distribution from a given location and thus determine any changes in distribution that might result from differences in weather and other factors.

In fair measure, the original objectives of the program to band mallard locals has been met. Therefore, it seems appropriate to examine mallard recoveries in more detail.

Method of Analysis

In this section, neither aerial survey strata nor political subdivisions were used to accumulate banding locations for purpose of analysis. Rather, the distribution of first hunting season recoveries from each banding location was examined and those with similar recovery distribution patterns were grouped together. Generally speaking, all banding locations within each one-degree block were arbitrarily totaled and examined together. Degree blocks with similar characteristics were then grouped into subdivisions of the breeding range which shall be referred to as reference areas. If the number of mallards banded within a State or Province was small, the State or Province was considered as a single reference area even though one might suspect that additional bandings will indicate that one or more subdivisions might be needed. Political boundaries were used to separate reference areas where practical because they best fit available data on size and distribution of the breeding population. Reference areas were grouped, for purposes of presenting the tabular material in this report, into 8 regions. The 8 regions and the reference areas contained within each are delineated in figure 3.

Banding Data

Effect of capture methods

As mentioned in the introduction, this report includes ducklings caught either in traps (by bait or drive methods) or by dogs and banded in a normal manner. When the data from all sources were summarized, ducklings caught by dogs and assumed to be uninjured had direct recovery rates much lower than those of birds captured in traps. The low recovery rate associated with dog-caught birds suggests that serious injuries were frequently undetected and that these injuries resulted in a mortality of approximately 20 percent. Such mortality probably occurred soon after banding.

Because the location of bandings may affect recovery rates, it was necessary to determine whether this cause, rather than method of capture, had produced the differences described above. Recovery rates of birds caught by dogs are compared with those of trapped birds from the same Province in table 20. Even though recovery rates varied geographically, those for dog-caught birds varied in the same direction and magnitude as trapped birds, but in each case with lower recovery rates. This was true in all cases except for the State of Washington where recovery rates for dog-caught birds were higher. However, this is likely explained by small sample size. Although it was definite that use of dogs resulted in higher immediate mortality than use of trapping methods, it was concluded that determinations of geographical distribution would not be affected by method of capture. Thus both dog-caught and trap-caught birds were used collectively when determining recovery distributions.

Geographical distribution

The geographical distribution of banding effort reflects both the relative distribution and magnitude of breeding populations and the accessibility of these populations to banders (fig. 4). Thus, north to about 54° of latitude, bandings may roughly indicate the distribution of the breeding population. Beyond this, relatively few bandings are available for large and important populations. The relation of the size of the breeding population to banding intensity as indicated by recoveries is summarized in table 21. It may be noted that areas including Alaska, Yukon, Northwest Territories, and all other regions north of 54° of latitude support about 35 percent of the breeding population, but are represented by only 1.3 percent of the total recoveries. Although this difference is inflated by use of population data gathered in 1961 when prairie populations were low, there can be no doubt that northern populations are inadequately represented in our sample.

Bandings with their associated direct and indirect recoveries (first hunting season and second or later hunting season recoveries, respectively) are summarized by reference area in table 22. These reference areas are geographical regions from which the distribution of recoveries was relatively homogeneous. The characteristics of each reference area are described in detail in a subsequent section of this report. More than 75 percent of bandings were from the prairies and parklands extending from Alberta to western Manitoba in southern Canada. This region provides the largest segment of mallards for the Central and Mississippi Flyways, and perhaps also for the Pacific and Atlantic Flyways.

Chronology

Bandings are summarized by year in table 23. Few bandings before 1950 were available for this study, because the term "local" was not used as an age designation until then. Banding effort increased after 1954, reaching a peak in 1957 and 1958. The decrease in bandings from 1959 to 1961 may reflect the lower production of young in recent years.

Although banding effort varied in time and intensity among regions, in most areas bandings span several years, including those of high waterfowl populations in the mid-fifties and the subsequent years of low populations which still persist. Thus, the bandings presently available for analysis can be viewed as a composite of various population levels and habitat conditions, realizing, of course, that the end result is more closely related to high population levels and good habitat conditions, since these situations have produced larger banded samples.

Sex ratios

The sex composition of the combined banded samples of normal and dog-caught birds was 51.34 percent males to 48.66 percent females (table 24). Although the difference from a 50:50 sex ratio is slight, it is highly significant ($p<.0005$). The imbalance in favor of males was consistent from area to area, and males predominated in all regions in which the banded sample exceeded 500 birds. I am not certain, however, that the sample reflects the actual sex composition of the population, because males may reach a bandable size at a younger age than females and thus contribute a bias to the estimates. Errors in sexing young birds would not explain the difference, for when such errors occur, they probably favor females.

Relation Between Reference Areas of Banding and Harvest Areas

The distribution of direct recoveries of mallards banded as locals from each 10-minute grid of banding to the degree block of recovery suggests a continuous cline in migration routes among various breeding areas. Thus, young mallards from western portions of the breeding range move southward into the Pacific Flyway. Further east they move either southwest to the Pacific Flyway or south and southeast to the Central and Mississippi Flyways in fairly constant proportions for a given area, but with a gradually increasing proportion going to the Mississippi Flyway as origin on the breeding range shifts eastward.

In the discussion which follows, reference areas of banding have been grouped into eight categories. Each grouping and the respective reference areas found within are illustrated in figure 3.

Northern Pacific group

Direct recoveries from Alaska and British Columbia bandings indicated movement to or within the Pacific Flyway. The Alaska population appeared to be strongly migratory with movement to or along the Pacific coast, mostly terminating in southern British Columbia, Washington, or Oregon (table 25). British Columbia mallards had a recovery pattern almost identical to those from Alaska (table 25 and fig. 5). Bandings were lacking for Yukon, which was provisionally grouped with reference areas in Alaska and British Columbia on the basis of recoveries from bandings in Alaska and the District of Mackenzie.

Western United States group

The distribution of direct recoveries from bandings in all States of the Pacific Flyway which have breeding populations of mallards suggested that mallards produced in this region are essentially nonmigratory (figs. 6 and 7). Most recoveries were from within the State of banding, with the remainder randomly scattered from the banding station as permitted by available habitat.

Western Interior Canada group

Recoveries of bandings from the western border of Alberta through the western third of Saskatchewan and north to approximately 55° latitude indicated a gradual shifting in their pattern of distribution from a southwesterly direction to the Pacific coast to a

southeasterly direction across the Central Flyway to the lower Mississippi region (figs. 8, 9, and 10). If we consider only recoveries in the United States, about 74 percent of recoveries from bandings in southwestern Alberta were from the Pacific Flyway, but only 9 percent were from bandings in southwestern Saskatchewan (table 25).

Northern Alberta, northwestern Saskatchewan, and all of Mackenzie Territory were provisionally grouped with these reference areas of widely varied kill patterns.

Northern Plains group

Reference areas in this region show a continuation of the shifting of kill patterns described above, but recoveries in the Pacific Flyway were lacking, and essentially all birds moved through or within the Central Flyway to the lower Mississippi or Gulf Coast regions. Recoveries were generally southeast from Saskatchewan and Montana, to the central Mississippi region and then south to the Gulf Coast, but were somewhat more directly southerly from western Manitoba and the Dakotas (figs. 11 to 14). A somewhat lower proportion of Canadian bandings was recovered in the Central Flyway as compared to bandings from within the Flyway (table 25). The difference was probably caused by the higher vulnerability of ducks in the vicinity of banding stations, as this factor would affect only birds banded within the Flyway.

West-central United States group

Recoveries from bandings in Wyoming, Colorado, and States to the south within the Central Flyway were nearly all from within the Central Flyway (table 25 and figs. 15 and 16). The populations in reference areas of this region can, for practical purposes, be considered resident. Most recoveries were in the general vicinity of the banding station or were randomly scattered from it, and there was only a slight tendency for southward movement into Texas or the lower Mississippi region.

Eastern Prairie and Great Lakes group

Recoveries from bandings in eastern Manitoba, Keewatin, Ontario, excepting the southeastern corner, and all States in the Mississippi Flyway having breeding populations of mallards were primarily in the Mississippi Flyway. Recoveries from bandings in Minnesota (fig. 17) and southeastern Manitoba were on a broad front south through the States bordering the Mississippi River. Kill patterns from other reference areas in the region are ill-defined, a reflection of the relatively small population and consequent small number of bandings available for analysis. A high proportion of recoveries, however, was in the Province or State of banding.

Eastern Great Lakes group

Banding in the small region consisting of southeastern Ontario and the portion of New York bordering Lake Ontario produced recoveries in both the Mississippi and the Atlantic Flyways (table 25). Recoveries in the Mississippi Flyway appeared to result from a random movement in the region of the Great Lakes. Movements of birds into the Atlantic coastal region appeared to be more definite, with migration from the Great Lakes through the Finger Lakes region of New York and the Susquehanna River to Chesapeake Bay. This pattern is similar to that for the small proportion of mallards from the northern part of the Mississippi Flyway that move to the Atlantic Flyway.

Atlantic group

This area includes all States of the Atlantic Flyway excepting the portion of New York adjacent to Lake Ontario and all Canadian Provinces east of Ontario. All direct recoveries (23) from reference areas in this region have been within the Atlantic Flyway or from adjacent parts of Canada. Mallard breeding populations in this region are low and are probably of most importance to the New England States. Reference areas in this region probably do not contribute as greatly to the kill from Chesapeake Bay and south as does the small proportion (1 to 4 percent) of birds from the Canadian prairies, North Dakota, and northern Minnesota.

Two distinct migration routes appear to be used by prairie mallards that winter on the Atlantic seaboard. Those originating in western Manitoba and Saskatchewan follow routes to the central Mississippi Flyway region and then move through Kentucky, Tennessee, and Alabama to the Atlantic coast. The major movement appeared to follow the Tennessee River and adjacent watersheds to a terminus in South Carolina (figs. 10, 11, and 12). Thus, about 80 percent of recoveries in the Atlantic Flyway from banding in western Manitoba and Saskatchewan occurred between 32° and 37° of latitude; while 10 percent of the recoveries indicated a northern route of lesser importance through the Great Lakes and the Susquehanna River into Chesapeake Bay. Birds from North Dakota and Minnesota appeared to follow this northern route, and all of the recoveries in the Atlantic Flyway from these two States were north of 35° latitude. A small fraction of birds from the Canadian prairies, the Dakotas, and Minnesota moved along the Gulf Coast and were recovered in western Florida, but none appeared to reach the Atlantic coast.

Recovery Patterns

The general characteristics of recovery patterns were described for reference areas in the preceding section. These general characteristics are summarized in table 25 which provides the percentage of direct recoveries in each flyway from each reference area, using as a base only those recoveries from the United States. Recoveries from Canada are given as a percentage of the total recoveries. Tables 26 through 33 summarize the distribution of recoveries by State and Province from each reference area. Figures 5 through 16 illustrate the distribution of recoveries by degree block. These tables and figures are based on total direct recoveries of both sexes, and are assumed to represent the average distribution of the kill, although the number of recoveries may have varied considerably from one year to another as banding effort fluctuated. Differences in band reporting rates between regions, as discussed by Bellrose (1955) and Geis and Atwood (1961) have not been considered in this analysis, and may bias the proportions cited in the tables to an unknown degree.

Annual variation

The annual distribution of direct recoveries by flyway and latitude for the period of 1954 to 1961 is summarized for the most important production areas in tables 34 to 40. The proportion of young mallards recovered in Canada was fairly consistent for given conditions and areas, but was somewhat higher subsequent to the onset of drought in 1958 and 1959 and the decline in populations in the Prairie Provinces. It appeared that even with somewhat more restrictive regulations, hunters in Canada were able to take a relatively greater proportion of young mallards during the period of low populations than in years of normal or high waterfowl populations. The relatively low recovery rates in the United States during the period of low populations may have resulted from the more restrictive regulations there than in Canada. Overall recovery rates declined in both Canada and the United States.

An important segment of the populations from Alberta and western Saskatchewan migrate to the Pacific Flyway (tables 34 to 36). The proportion of recoveries in this flyway did not appear to vary statistically from year to year. The relatively high variability of the samples probably resulted from the small sample size.

The annual distributions of direct recoveries between the Central and Mississippi Flyways have a reciprocal relation to each other as noted by Low (1957). However, the only statistically significant shift in area of recovery that could be detected for any of the reference areas was from 1957 bandings in southeastern Saskatchewan. In this

year, the proportion of recoveries increased in the Central Flyway from 28 to 45 percent and decreased in the Mississippi Flyway from 70 to 53 percent (table 37). In 1958, recoveries in the Central Flyway declined to 23 percent and in the Mississippi Flyway increased to 74 percent. The marked increase in the 1957 recoveries in the Central Flyway was associated with a high proportion of band recoveries between 44° and 49° of latitude (table 37). January inventories of wintering populations revealed more than double the average number of waterfowl in the northern part of the Central Flyway, thus suggesting, as did the distribution of recoveries, that northward shifting of the population accounted for the increased Central Flyway kill. The ratio of Central Flyway to Mississippi Flyway recoveries was also higher than average for 1957 bandings in southeastern Alberta and southwestern Saskatchewan, although in these areas the differences from adjacent years are not significant, nor is the relation to latitudinal distribution as pronounced.

In 1955 the ratio of Central Flyway to Mississippi Flyway recoveries from bandings in southeastern Alberta and southern Saskatchewan tended to be lower than for other years (tables 35 to 37). In 1955, November was extremely cold throughout Manitoba, Saskatchewan, and Alberta. Aerial surveys by the Canadian Wildlife Service in central and western Saskatchewan indicated that most water areas were frozen and for practical purposes no ducks remained, whereas in 1954 more than 130,000 ducks were counted in early November and 19,000 were observed as late as November 23. It seems probable that in 1955 cold weather caused mallards to leave the northern portions of the Central Flyway, resulting in the increased proportion of recoveries in the Mississippi Flyway. In 1957, extremely mild weather throughout the hunting season caused mallards to remain much farther north than normal, allowing them to be shot in the northern States of the Central Flyway.

We may conclude from the various data that have been discussed that (1) the direction of migration from a given reference area is probably stable, (2) the timing and ultimate destination of migratory movements may vary as a result of weather conditions during the period of migration, and (3) where migration routes involve crossing one flyway to reach another the timing of migration may cause changes in the distribution of kill between the two flyways. Thus, mallards moving southwestward from Alberta or western Saskatchewan, a relatively short distance across the Central Flyway, may be expected to be consistent in the portion of the population that reaches the Pacific Flyway. However, for mallards moving long distances southeastward across the Central Flyway, changes in the speed and timing of migration may result in varying proportions of birds that reach the Mississippi Flyway or that are available to hunters in the Central Flyway during their migration.

Because fluctuations in the relative number of recoveries between the Mississippi and Central Flyways were small as compared with the average proportion of total recoveries, and because variations resulted from unpredictable conditions that occurred during the hunting season, it appears that the average distribution of recoveries from a given reference area provides the most useful information for predicting the location of the kill.

Sex and age variation

Sex and age variation in the distribution of recoveries was examined using the large sample of recoveries from bandings in Saskatchewan. The distribution of direct recoveries from southwestern Saskatchewan is illustrated in figure 10, and the distributions of indirect recoveries of males and females are presented in figures 18 and 19. The data illustrated in these figures are summarized in table 41.

Important features of kill pattern that should be noted in figures 18 and 19 are (1) direct and indirect recoveries of both sexes cover essentially identical geographical areas, (2) except for the high incidence of direct recoveries near the banding station, the direct and indirect recoveries from bandings in Saskatchewan have similar distribution patterns, and (3) a highly developed homing tendency is indicated by indirect recoveries that are no more scattered from the area of banding than the direct recoveries of birds banded as locals. The tendency to return to the general region of origin is apparent among males as well as females and does not appear to have been changed by habitat deterioration during drought years. However, hunting pressure in regions north of the prairies is so low that analysis of band recoveries may have failed to show a northward displacement of mallards, if such did occur, during the drought in the prairie region.

Although the distributions of recoveries of males and females were essentially similar, there were several small but statistically significant differences (table 41). For direct recoveries, there was a significant difference ($p<.05$) between the proportion of males (26.8 percent) and the proportion of females (31.1 percent) recovered in the reference area of banding. Because there was not a significant difference between the proportions of immature males and females taken in Canada (virtually all of which were in the general region of banding), and because the proportions of males and females taken in other flyways or latitudinal areas were similar, it might appear that the statistical difference is not real. However, data from southeastern Alberta and southeastern Saskatchewan (tables 42 and 43) indicated a similar tendency for this difference to occur and it is necessary to conclude that the difference is real.

The data on direct recoveries from bandings in southeastern Alberta (table 43) suggested that there may have been some difference in the proportions of males and females recovered in the Pacific and Central Flyways. However, the difference was not significant for our small sample, nor did the data from either of the Saskatchewan areas suggest a similar situation.

A comparison of indirect recoveries of males and females, which resulted from bandings in southwestern Saskatchewan (table 41), indicated that the proportion of banded females recovered in Canada or the reference area of banding during the second or later years following banding was significantly greater than that for males ($p < .05$). This difference probably resulted from a sexual variation in migratory behavior, for as I indicated earlier, the general geographical distribution of recoveries in Canada was about the same for males and females.

Another difference, which may well be associated with that above, was the low proportion of adult females as compared to that of adult males that was recovered in the area between 44° and 49° of latitude, or north of a line between Rochester, Minn., and Pierre, S. D., to the Canadian borders. The difference in latitudinal distribution of indirect recoveries of males and females was not reflected in differences in distribution among the flyways for bandings from southwestern Saskatchewan. However, relatively fewer females than males were recovered in the Central Flyway, and more in the Mississippi Flyway, from bandings in southeastern Saskatchewan (table 42).

A final difference in the distribution of recoveries of males and females was related to that part of the population recovered in the Atlantic Flyway. The proportion of indirect recoveries of males in the Atlantic Flyway exceeded that of females from bandings in both southeastern and southwestern Saskatchewan (tables 41 and 42). The proportions were reversed for direct recoveries.

Bandings in southwestern Saskatchewan (table 41) produced a greater proportion of direct recoveries than of indirect recoveries in Canada and in the area of banding irrespective of sex. The proportion of direct recoveries tended to be lower in the Central and Pacific Flyways than that of indirect recoveries, but in the Mississippi Flyway the proportion of direct recoveries was significantly greater than that of indirect recoveries. The relatively greater kill of adults in the Pacific and Central Flyways as compared with the Mississippi Flyway was consistent for both sexes from bandings in Saskatchewan and southeastern Alberta, and although statistical significance cannot be demonstrated in each case, the difference is no doubt real. It is possible that the difference indicates that a larger proportion of adults than immatures migrated to the Pacific

Flyway, but it seems more probable that the difference reflects a lesser vulnerability of young ducks which migrate to the Pacific Flyway, leaving a larger number available to be taken there as adults. This hypothesis corresponds to the vulnerability pattern suggested below for mallards banded in Alaska and northern Canada.

In considering the latitudinal variation between the direct and indirect recoveries discussed above, we find that significantly more direct than indirect recoveries were reported from north of 50° latitude. Relatively fewer direct recoveries were obtained between 34° and 49°, but the proportion was about equal to or slightly higher than that of indirect recoveries south of 34°. If we ignore recoveries north of 49° and calculate proportions from the remainder (mostly migrating birds), we find that the proportion was slightly lower for direct than indirect recoveries between 44° and 49° of latitude, significantly lower between 39° and 44°, about the same between 34° and 39°, and significantly higher south of 34°. The pattern of direct recoveries in migration and wintering areas thus indicated a more southerly distribution than that of indirect recoveries.

In general, the distribution of direct recoveries of immature mallards was more like that of adult females than of adult males. However, immature birds tended to be shot further south than either adult males or females, and more often in the Mississippi than in the Central Flyway. Immatures and adults of both sexes followed similar annual fluctuations in distribution of recoveries (tables 41 through 45).

Although the dissimilarities between sex and age groups have been stressed, it should be noted that in most cases the differences, although they may be significant, were relatively small (less than 3 to 5 percent), and that sex and age groups from the same breeding area have similar distributions of recoveries. By far the most pronounced difference in kill distribution of sex or age groups that bandings of locals have demonstrated is the high proportion of immature mallards, relative to adults, killed on the breeding grounds.

Recovery Rates

Direct recovery rates have varied among reference areas and years. Because of the variation, which is related to hunting pressure, the recoveries are more precise in measuring the distribution of the kill than the proportions of populations that migrate to various areas.

Direct recovery rates of bandings in each reference area are presented in table 46. Recovery rates appeared to vary as a result of both the location of banding and route or terminus of migration. Thus, bandings in Alaska have produced recovery rates that are much lower than those from British Columbia, although the location of recoveries was quite similar for both (fig. 5). A similar example is provided by the low recovery rates resulting from bandings in Mackenzie Territory as compared with those from Alberta. The differences in both of these examples may be attributed to the location of the banding station. The low recovery rates in the northern areas probably resulted from the low recovery rate in the vicinity of the banding station.

Recovery rates from bandings in the prairie regions of Alberta and Saskatchewan were relatively uniform but much lower than the recovery rates resulting from bandings in the adjoining Dakotas and Minnesota. Again, the geographical distribution of recoveries can be seen to be quite similar (figs. 6 to 13), and the major part of the difference must result from the location of banding.

If we consider recovery rates by flyway, it is evident that reference areas contributing mainly to the Pacific and Mississippi Flyways tended to have higher recovery rates than those contributing to the Central and Atlantic Flyways. The differences may be caused by one or several factors, such as number of hunters, band reporting rates, or differences in hunting regulations.

Recovery rates are summarized by year of banding for the important mallard production areas of the Canadian Prairie Provinces and the North Central States in table 47. Recovery rates were relatively consistent for each area during the period 1954 to 1958, but dropped sharply in most areas as a result of the restrictive regulations initiated in 1959. Recovery rates declined significantly for bandings in southwestern Saskatchewan and in South Dakota in 1957 and slightly in southeastern Alberta, southeastern Saskatchewan, and southwestern Manitoba. Because regulations were as liberal in 1957 as in 1956, the cause of the decreased recovery rates must lie elsewhere. The most evident factor occurring in 1957 was the failure of many birds to migrate to normal southern wintering areas. The changed proportions of recoveries in the Central and Mississippi Flyways as a result of this altered distribution were considered in a previous section. The present data indicate that not only the relative proportions of the kill in the two flyways were altered, but the decreased kill in the Mississippi Flyway was not offset by an increase in the Central Flyway sufficient to prevent a general decrease in recovery rates.

The direct recovery rates from bandings in all major production areas (table 46) were greater for males than for females. The average rate for all bandings was 11.0 percent for males and 9.2 percent for females. Hunters may tend to select the more colorful male, thus causing the difference in recovery rates of males and females, but behavioral differences may also act to increase the vulnerability of males.

Summary and Conclusions

1. Birds caught by dogs had lower recovery rates than birds captured in traps or other methods.

2. The sex composition of mallard ducklings that were banded was slightly imbalanced in favor of males.

3. Banding data now available permit the analysis of distribution of kill of ducks produced in important breeding areas south of 54° latitude, but are insufficient to permit a similar analysis for important northern breeding areas.

4. Bandings of locals were not used to estimate the contribution of production areas to the total kill in a given region because of the lack of bandings and associated recoveries from northern areas. Furthermore, a procedure which would relate the size of each breeding population to the recoveries available was considered to be beyond the scope of this study.

5. Mallards produced in Alaska, British Columbia, and States of the Pacific Flyway contributed only to the kill in the Pacific Flyway.

6. Much of the kill in the Pacific Flyway was derived from the Prairie Provinces of Canada.

7. From Alberta eastward, a gradually increasing portion of mallards are harvested southeastward through the Central Flyway to the lower Mississippi region, and the Pacific Flyway component disappears in southeastern Saskatchewan populations.

8. The portion of the mallard kill from Canadian production areas that occurs in the Central Flyway is related to the distance birds must move across the flyway to reach the lower Mississippi region. This relation results in a decreasing portion of birds that contribute to the kill in the Central Flyway relative to that of the Mississippi Flyway as their origin shifts eastward across the Prairie Provinces.

9. Small populations of mallards in the Central Flyway that are near the southern margins of the breeding range are largely nonmigratory and contribute primarily to the kill in the State of banding.

10. Mallards produced in all States in the Mississippi Flyway and regions to the north contribute primarily to the kill within the flyway.

11. Relatively small populations of mallards within the Atlantic Flyway and in regions to the north contribute primarily to the kill in the Atlantic Flyway. In areas from Chesapeake Bay south, birds produced in the Mississippi and Central Flyway areas may be more important to the total kill. Birds from the Canadian Prairies that reach the Atlantic Flyway appear to move primarily through the Tennessee Valley and nearly all returns are from south of 37° latitude. Mallards from the Great Lakes region seem to move south from Lake Ontario into Chesapeake Bay.

12. Annual variations in the distribution of direct recoveries of mallards banded as locals were not great, but some annual fluctuations may occur. It appears that the direction of migration from a given reference area is stable, but that the speed or timing, and ultimate destination, of migratory movements may vary as a result of weather con ditions during the period of migration. Where migration routes involve crossing extensive portions of one flyway to reach another, the speed and timing of migration may cause changes in the relative recovery rates between the two flyways. Such changes have occurred in the Central and Mississippi Flyways.

13. Direct recoveries of both sexes of mallards banded as locals are nearly identical in distribution, the only difference being a slightly greater proportion of females that are recovered in the degree block of banding. The geographical area from which indirect recoveries have been reported was nearly identical to that for direct recoveries, but the proportion of the recoveries occurring in the various portions of this area differed. The primary difference between recoveries of adults and immatures was the smaller proportion of adults that were recovered in the breeding areas. In general, the distribution of recoveries of immatures was more similar to recoveries of adult females than to those of adult males.

14. Recovery rates of mallards varied, because of the sex, the area of banding, the migration route, and the wintering area. The average direct recovery rate was 11 percent for males and 9.2 percent for females. Recovery rates from important production areas in the United States tended to be higher than recovery rates in Canada, and those in southern Canada higher than those of northern Canada and Alaska. Recovery rates for birds entering the Central and Atlantic Flyways were somewhat lower than for those entering the Pacific and Mississippi Flyways.

15. A marked decrease in recovery rates was indicated for bandings from 1959 through 1961. The decrease in recovery rates for this period was concurrent with generally low waterfowl populations and restrictive regulations.

16. Breeding population aerial census strata (fig. 2), discussed in part 1, were established on the basis of habitat types and relative population density. It was thought that by reason of their geographic configuration they might not be useful in analysing recovery patterns because of differences in distribution from portions of the same stratum. However, after analysing the distribution of recoveries from areas of reference with similar recovery patterns throughout, and after reviewing weather and habitat conditions over the period of study within each of the aerial census strata, it was determined that insufficient changes had occurred in the distribution of birds within census strata to invalidate predictions of kill distribution from these strata based on average band recoveries. Since breeding population and production data are readily available for each of the census strata, it is concluded that the data on distribution of harvest from aerial census strata are useful information for management purposes.

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Table 1.--Direct recoveries of mallards banded in breeding population census strata

Region of banding (survey stratum)	Number recovered	Recoveries by flyway (percent)							
		Atlantic	Miss.	Central	Pacific	Alaska	Canada	So. of the U. S.	Total
(03) Alaska	35			2.8	31.4	22.8	42.8		99.8
(13) Alberta	10			10.0	10.0		80.0		100.0
(26) Alberta	510		7.8	11.2	26.5		54.5		100.0
(27) Alberta	442		16.1	13.3	11.5		59.0		99.9
(28) Alberta	31		6.4	19.4	29.0		45.2		100.0
(16) Saskatchewan	24		37.5	12.5			50.0		100.0
(19) Saskatchewan	1679	0.8	32.9	23.8	4.5		37.8	0.2	100.0
(20) Saskatchewan	596	0.7	36.4	18.3	0.3		44.3		100.0
(21) Saskatchewan	503	0.8	33.8	15.3	2.0		48.1		100.0
(22) Saskatchewan	474	1.9	44.1	13.3	0.2		40.5		100.0
(23) Saskatchewan	91		25.3	31.9	8.8		34.1		100.1
(17) Manitoba	14		35.7				64.3		100.0
(24) Manitoba	259	1.9	29.7	11.6			56.8		100.0

Table 1.--Direct recoveries of mallards banded in breeding population census strata--Continued

Region of banding (survey stratum)	Number recovered	Recoveries by flyway (percent)							
		Atlantic	Miss.	Central	Pacific	Alaska	Canada	So. of the U. S.	Total
(25) Manitoba	27		33.3	7.4			59.3		100.0
(36) Manitoba	14		35.7	64.3					100.0
(30) North Dakota	119	0.8	32.8	63.9			2.5		100.0
(33) South Dakota	338		35.2	63.6	0.3		0.9		100.0
(35) Minnesota	214	0.5	90.6	6.1			2.8		100.0

Table 2.--Direct recoveries of gadwalls banded in breeding population census strata

Region of banding (survey stratum)	Number recovered	Recoveries by flyway (percent)							
		Atlantic	Miss.	Central	Pacific	Alaska	Canada	So. of the U. S.	Total
(26) Alberta	43		7.0	16.3	16.3		53.5	7.0	100.1
(27) Alberta	61		13.1	32.8	9.8		42.6	1.6	99.9
(19) Saskatchewan	34	5.9	23.5	29.4	2.9		35.3	2.9	99.9
(20) Saskatchewan	10		50.0	30.0			10.0	10.0	100.0
(21) Saskatchewan	20	5.0	35.0	40.0			20.0		100.0
(22) Saskatchewan	48	4.2	43.8	33.3			18.8		100.1
(24) Manitoba	29	3.4	48.3	6.9			41.4		100.0
(30) North Dakota	12		33.3	58.3				8.3	99.9
(33) South Dakota	108	3.7	37.0	59.3					100.0
(35) Minnesota	16		81.2				18.8		100.0

Table 3.--Direct recoveries of widgeons banded in breeding population census strata

Region of banding (survey stratum)	Number recovered	Recoveries by flyway (percent)							
		Atlantic	Miss.	Central	Pacific	Alaska	Canada	So. of the U. S.	Total
(03) Alaska	150		3.3	2.0	64.7	6.0	23.3	0.7	100.0
(13) Alberta	14		35.7	14.3	28.6		14.3	7.1	100.0
(26) Alberta	216	0.9	0.5	7.4	66.7		24.1	0.5	100.1
(27) Alberta	144	2.1	10.4	10.4	54.2		22.6	0.7	100.4
(16) Saskatchewan	19	5.3	42.1	15.8	5.3		31.6		100.0
(19) Saskatchewan	90	3.3	10.0	22.2	46.6		13.3	4.4	99.8
(20) Saskatchewan	57	15.8	35.1	24.6	3.5		17.5	3.6	100.0
(21) Saskatchewan	98	8.2	24.5	24.5	23.5		14.3	5.1	100.1
(22) Saskatchewan	119	10.9	42.8	19.3	5.0		18.5	3.3	99.8
(24) Manitoba	55	14.5	40.0	16.4			25.4	3.6	99.9
(30) North Dakota	12		33.3	58.3				8.3	99.9

Table 4.--Direct recoveries of green-winged teals banded in breeding population census strata

Region of banding (survey stratum)*	Number recovered	Recoveries by flyway (percent)							
		Atlantic	Miss.	Central	Pacific	Alaska	Canada	So. of the U. S.	Total
Alaska	19		5.3	10.5	73.7	5.3	5.3		100.1
N.W.T.	5			80.0			20.0		100.0
Alberta	30		6.7	46.7	26.7		16.7	3.3	100.1
Saskatchwan	20		35.0	55.0	5.0		5.0		100.0

*All strata within States or Provinces are combined

Table 5.--Direct recoveries of blue-winged teals banded in breeding population census strata

Region of banding (survey stratum)	Number recovered	Recoveries by flyway (percent)							
		Atlantic	Miss.	Central	Pacific	Alaska	Canada	So. of the U. S.	Total
(26) Alberta	60	3.3	3.3	13.3	3.3		48.3	28.4	99.9
(27) Alberta	92	1.1	8.7	12.0			46.7	31.5	100.0
(19) Saskatchewan	51	2.0	21.6	21.6			21.6	33.3	100.1
(20) Saskatchewan	57	1.8	40.4	14.0			28.1	15.9	100.2
(21) Saskatchewan	31		32.2	9.7			29.0	29.0	99.9
(22) Saskatchewan	68	2.9	38.2	11.8			29.4	17.7	100.0
(24) Manitoba	112	2.8	41.1	7.1			30.4	18.7	100.1
(30) North Dakota	142	1.4	44.4	30.3			1.4	22.5	100.0
(31) North Dakota	12		25.0	66.7				8.3	100.0
(33) South Dakota	441	1.6	47.6	35.1			2.0	13.6	99.9
(35) Minnesota	314	2.2	80.2	3.8			2.9	10.8	99.9

Table 6.--Direct recoveries of shovelers banded in breeding population census strata

Region of banding (survey stratum)	Number recovered	Recoveries by flyway (percent)							
		Atlantic	Miss.	Central	Pacific	Alaska	Canada	So. of the U. S.	Total
(03) Alaska	45			2.2	68.9	15.5	8.9	4.4	99.9
(26) Alberta	265		2.3	5.7	64.9		23.4	3.8	100.1
(27) Alberta	90		3.3	17.8	43.3		28.9	6.7	100.0
(28) Alberta	20				75.0		10.0	15.0	100.0
(16) Saskatchewan	12	8.1	16.7	25.0			50.0		99.8
(19) Saskatchewan	88		9.1	29.5	31.8		21.6	8.0	100.0
(20) Saskatchewan	35	5.7	28.6	37.1	8.6		8.6	11.4	100.0
(21) Saskatchewan	46		6.5	30.4	10.9		50.0	2.2	100.0
(22) Saskatchewan	71	1.4	11.3	45.1	9.8		23.9	8.4	99.9
(23) Saskatchewan	19		5.3	26.3	63.2		5.3		100.1
(24) Manitoba	42		31.0	33.3	4.8		26.2	4.8	100.1
(30) North Dakota	29	6.9	41.4	48.3				3.4	100.0
(33) South Dakota	56	1.8	30.4	66.1			1.8		100.1
(35) Minnesota	11		72.7	27.3					100.0

Table 7.--Direct recoveries of pintails banded in breeding population census strata

Region of banding (survey stratum)	Number recovered	Recoveries by flyway (percent)							
		Atlantic	Miss.	Central	Pacific	Alaska	Canada	So. of the U. S.	Total
(03) Alaska	117	1.7		4.3	57.3	13.8	22.2	0.8	100.1
(26) Alberta	487		1.0	6.6	63.6		25.5	3.3	100.0
(27) Alberta	103		1.0	5.8	51.4		38.8	2.9	99.9
(28) Alberta	100		2.0	5.0	80.0		9.0	4.0	100.0
(19) Saskatchewan	218	0.4	9.2	22.5	44.5		16.5	6.9	100.0
(20) Saskatchewan	42		19.0	26.2	35.7		11.9	7.1	99.9
(21) Saskatchewan	59		6.8	16.9	33.9		42.4		100.0
(22) Saskatchewan	51		5.9	27.4	19.6		41.2	5.9	100.0
(23) Saskatchewan	66		4.5	16.7	59.1		4.5	15.2	100.0
(24) Manitoba	24	4.2	20.8	29.2	16.7		25.0	4.2	100.1
(33) South Dakota	220	2.3	32.3	54.5	5.4		0.9	4.5	99.9
(35) Minnesota	35	5.7	74.3	14.3			5.7		100.0

Table 8.--Direct recoveries of redheads banded in breeding population census strata

Region of banding (survey stratum)	Number recovered	Recoveries by flyway (percent)							
		Atlantic	Miss.	Central	Pacific	Alaska	Canada	So. of the U. S.	Total
(22) Saskatchewan	33	9.1	27.3	21.2			42.4		100.0
(24) Manitoba	51	7.8	43.1	17.6			31.4		100.0
(25) Manitoba	104	4.8	39.4	17.3			38.5		100.0
(30) North Dakota	42	7.1	35.7	47.6			9.5		99.9
(33) South Dakota	80		36.2	60.0			3.8		100.0
(35) Minnesota	150	8.0	77.3	5.3			9.3		99.9

Table 9.--Direct recoveries of canvasbacks banded in breeding population census strata

Region of banding (survey stratum)	Number recovered	Recoveries by flyway (percent)							
		Atlantic	Miss.	Central	Pacific	Alaska	Canada	So. of the U. S.	Total
(03) Alaska	33	6.1			69.7	3.0	18.2	3.0	100.0
(26) Alberta	17			17.6	41.2		41.2		100.0
(27) Alberta	11	18.2	9.1	9.1	36.4		27.3		100.1
(19) Saskatchewan	20	10.0	25.0	30.0	15.0		20.0		100.0
(20) Saskatchewan	81	13.6	21.0	23.4	3.7		35.8	2.5	100.0
(21) Saskatchewan	20	20.0	15.0	15.0	10.0		35.0	5.0	100.0
(22) Saskatchewan	34	11.8	23.5	14.7	2.9		44.1	2.9	99.9
(24) Manitoba	144	19.4	27.1	11.1	1.4		40.3	0.8	100.1
(30) North Dakota	36	13.9	30.6	44.4			8.3	2.8	100.0
(33) South Dakota	25	8.0	40.0	48.0			4.0		100.0
(35) Minnesota	100	15.0	62.0	12.0	11.0				100.0

Table 10.--Direct recoveries of lesser scaups banded in breeding population census strata

Region of banding (survey stratum)	Number recovered	Recoveries by flyway (percent)							
		Atlantic	Miss.	Central	Pacific	Alaska	Canada	So. of the U. S.	Total
(03) Alaska	76	3.9	23.7	18.4	21.0	9.2	19.7	3.9	99.8
(07) N.W.T.	29	6.9	44.8	27.6			20.7		100.0
(13) Alberta	340	2.0	42.6	30.6	5.8		13.2	5.6	99.8
(26) Alberta	31	3.2	12.9	19.4	12.9		48.4	3.2	100.0
(27) Alberta	188	3.7	41.5	23.4	6.4		17.6	7.4	100.0
(16) Saskatchewan	95	6.3	43.2	29.5	1.0		14.7	5.3	100.0
(21) Saskatchewan	13	23.1	30.8	30.8			7.7	7.7	100.1
(22) Saskatchewan	35		40.0	20.0			40.0		100.0
(24) Manitoba	17	5.9	41.2	11.8			41.2		100.1
(30) North Dakota	14		35.7	64.3					100.0

Table 11.--Direct recoveries of mallards banded as locals by State or Province of recovery

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Alaska (35 recoveries)	Montana	2.8	2.8
	Oregon	8.6	
	Washington	22.8	31.4
	Alaska	22.8	22.8
	Alberta	2.8	
	British Columbia	40.0	42.8
		99.8	99.8
Alberta (995 recoveries)	Alabama	0.2	
	Arkansas	4.7	
	Illinois	0.6	
	Indiana	0.2	
	Iowa	0.5	
	Kentucky	0.3	
	Louisiana	1.9	
	Minnesota	0.3	
	Mississippi	0.7	
	Missouri	1.2	
	Ohio	0.1	
	Tennessee	0.5	
	Wisconsin	0.1	11.3
	Colorado	1.8	
	Kansas	0.9	
	Montana	2.5	
	Nebraska	1.8	
	New Mexico	0.2	
	North Dakota	0.2	
	Oklahoma	1.2	
	South Dakota	0.8	
	Texas	2.4	
	Wyoming	0.6	12.4
	Arizona	0.2	
	California	4.7	
	Idaho	4.9	
	Nevada	0.7	
	Oregon	4.4	
	Utah	0.5	
	Washington	4.2	19.6

Table 11.--Direct recoveries of mallards banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Alberta (con.)	Alberta	54.4	
	British Columbia	0.4	
	Manitoba	0.1	
	Saskatchewan	1.6	56.5
		99.8	99.8
British Columbia (111 recoveries)	Louisiana	0.9	0.9
	California	1.8	
	Idaho	2.7	
	Oregon	6.3	
	Washington	25.2	36.0
	British Columbia	63.1	63.1
		100.0	100.0
California (125 recoveries)	California	91.2	
	Oregon	8.8	100.0
		100.0	100.0
Colorado (85 recoveries)	Arkansas	1.2	1.2
	Colorado	85.9	
	Kansas	1.2	
	Nebraska	1.2	
	New Mexico	1.2	
	Texas	2.4	
	Wyoming	1.2	93.1
	Arizona	3.5	3.5
	Mexico	2.4	2.4
		100.2	100.2
Manitoba (314 recoveries)	Florida	0.3	
	Georgia	0.3	
	Maryland	0.3	
	South Carolina	0.6	1.5

Table 11.--Direct recoveries of mallards banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Percent of direct recoveries occurring in each Flyway
Manitoba (con.)	Alabama	0.3	
	Arkansas	8.6	
	Illinois	3.2	
	Indiana	0.6	
	Iowa	3.5	
	Louisiana	3.5	
	Michigan	0.6	
	Minnesota	2.5	
	Mississippi	1.0	
	Missouri	4.1	
	Ohio	0.3	
	Tennessee	1.3	
	Wisconsin	1.0	30.5
	Kansas	1.6	
	Montana	0.3	
	Nebraska	0.6	
	North Dakota	4.1	
	South Dakota	2.2	
	Texas	1.3	10.1
	Manitoba	52.9	
	Saskatchewan	4.8	57.7
		99.8	99.8
Michigan (11 recoveries)	Georgia	18.2	18.2
	Michigan	63.6	63.6
	Ontario	18.2	18.2
		100.0	100.0
Minnesota (465 recoveries)	Florida	0.2	
	North Carolina	0.4	
	Pennsylvania	0.4	
	Virginia	0.4	1.4

Table 11.--Direct recoveries of mallards banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Minnesota (con.)	Alabama	0.6	
	Arkansas	3.6	
	Illinois	3.4	
	Indiana	0.9	
	Iowa	4.1	
	Kentucky	0.4	
	Louisiana	2.4	
	Michigan	0.6	
	Minnesota	68.4	
	Mississippi	0.2	
	Missouri	2.4	
	Ohio	0.2	
	Tennessee	0.4	
	Wisconsin	3.9	91.5
	Kansas	0.2	
	Nebraska	0.2	
	North Dakota	1.7	
	South Dakota	1.5	
	Texas	1.1	4.7
	Manitoba	1.7	
	Ontario	0.4	2.1
		99.7	99.7
Montana (25 recoveries)	Arkansas	4.0	
	Missouri	8.0	12.0
	Kansas	4.0	
	Montana	28.0	
	Nebraska	8.0	
	North Dakota	12.0	
	Oklahoma	12.0	
	South Dakota	12.0	
	Texas	12.0	88.0
		100.0	100.0

Table 11.--Direct recoveries of mallards banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Nebraska (58 recoveries)	Arkansas	5.2	
	Missouri	1.7	6.9
	Colorado	1.7	
	Kansas	1.7	
	Nebraska	70.7	
	Oklahoma	1.7	
	South Dakota	8.6	
	Texas	6.9	91.3
	Saskatchewan	1.7	1.7
		99.9	99.9
New York (50 recoveries)	Delaware	2.0	
	Maryland	8.0	
	New Jersey	2.0	
	New York	56.0	
	North Carolina	4.0	
	Pennsylvania	6.0	
	South Carolina	4.0	
	Virginia	2.0	84.0
	Michigan	4.0	
	Minnesota	2.0	
	Ohio	2.0	8.0
	Ontario	8.0	8.0
		100.0	100.0
North Dakota (151 recoveries)	Virginia	0.7	0.7
	Arkansas	8.6	
	Illinois	1.3	
	Iowa	4.0	
	Louisiana	4.0	
	Minnesota	4.0	
	Mississippi	2.0	
	Missouri	6.0	
	Tennessee	2.0	
	Wisconsin	1.3	33.2

Table 11.--Direct recoveries of mallards banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
North Dakota (con.)	Nebraska	3.3	
	North Dakota	51.0	
	Oklahoma	0.7	
	South Dakota	8.6	63.6
	Manitoba	1.3	
	Ontario	0.7	
	Saskatchewan	0.7	2.7
		100.2	100.2
Ontario (10 recoveries)	New York	10.0	
	Virginia	10.0	20.0
	Ohio	60.0	60.0
	Ontario	10.0	10.0
		100.0	100.0
Oregon (60 recoveries)	California	8.3	
	Oregon	91.7	100.0
		100.0	100.0
Saskatchewan (3367 recoveries)	Florida	0.1	
	Georgia	0.1	
	Maryland	Trace	
	New York	Trace	
	North Carolina	0.1	
	Pennsylvania	Trace	
	South Carolina	0.4	
	Tennessee	1.4	
	Virginia	0.1	2.2
	Alabama	0.5	
	Arkansas	11.8	
	Illinois	3.0	
	Indiana	0.4	
	Iowa	2.1	
	Kentucky	0.7	
	Louisiana	6.5	
	Michigan	0.2	
	Minnesota	1.9	
	Mississippi	1.6	

Table 11.--Direct recoveries of mallards banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Saskatchewan (con.)	Missouri	4.2	
	Ohio	0.2	
	Tennessee	1.4	
	Wisconsin	0.4	34.9
	Colorado	0.7	
	Kansas	2.6	
	Montana	1.6	
	Nebraska	4.2	
	New Mexico	0.1	
	North Dakota	2.8	
	Oklahoma	1.3	
	South Dakota	2.8	
	Texas	3.8	
	Wyoming	0.2	20.1
	Arizona	0.1	
	California	0.7	
	Idaho	0.8	
	Oregon	0.5	
	Nevada	0.1	
	Utah	0.2	
	Washington	0.4	2.8
	Alberta	3.8	
	Manitoba	1.4	
	Ontario	Trace	
	Saskatchewan	35.5	40.7
	Mexico	0.1	0.1
		100.8	100.8
South Dakota (358 recoveries)	Arkansas	3.4	
	Illinois	3.9	
	Indiana	0.3	
	Iowa	4.5	
	Kentucky	0.3	
	Louisiana	2.0	
	Minnesota	12.6	
	Mississippi	0.8	
	Missouri	5.6	
	Tennessee	0.3	
	Wisconsin	1.7	35.4

Table 11.--Direct recoveries of mallards banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
South Dakota (con.)	Kansas	2.2	
	Nebraska	4.2	
	North Dakota	7.3	
	Oklahoma	0.6	
	South Dakota	48.3	
	Texas	1.1	63.7
	California	0.3	0.3
	Manitoba	0.6	0.6
		100.0	100.0
Utah (11 recoveries)	Utah	100.0	100.0
		100.0	100.0
Washington (397 recoveries)	California	1.0	
	Idaho	0.5	
	Oregon	5.8	
	Washington	88.9	96.2
	British Columbia	3.5	3.5
	Mexico	0.3	0.3
		100.0	100.0
Wisconsin (14 recoveries)	Michigan	7.1	
	Minnesota	7.1	
	Missouri	7.1	
	North Dakota	7.1	
	Tennessee	7.1	
	Wisconsin	64.3	99.8
		99.8	99.8

Total Recoveries - 6642

Table 12.--Direct recoveries of gadwalls banded as locals by State or Province of recovery

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Alberta (121 recoveries)	Alabama	0.8	
	Arkansas	0.8	
	Illinois	1.7	
	Iowa	0.8	
	Louisiana	5.0	
	Minnesota	0.8	
	Wisconsin	1.7	11.6
	Kansas	5.0	
	Montana	5.0	
	Oklahoma	2.5	
	South Dakota	4.1	
	Texas	9.9	26.5
	California	7.4	
	Idaho	1.7	
	Oregon	2.5	
	Utah	0.8	12.4
	Alberta	43.0	
	Saskatchewan	2.5	45.5
	Mexico	4.1	4.1
		100.1	100.1
California (329 recoveries)	Arizona	0.3	
	California	71.7	
	Idaho	0.3	
	Nevada	4.6	
	Oregon	21.6	98.5
	Mexico	1.5	1.5
		100.0	100.0

Table 12.--Direct recoveries of gadwalls banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Percent of direct recoveries occurring in each Flyway
Manitoba (31 recoveries)	Maryland	3.2	3.2
	Alabama	6.4	
	Louisiana	22.6	
	Michigan	3.2	
	Minnesota	6.4	
	Mississippi	3.2	
	Missouri	3.2	
	Wisconsin	3.2	48.2
	Kansas	3.2	
	South Dakota	3.2	
	Texas	3.2	9.6
	Manitoba	38.7	38.7
		99.7	99.7
Minnesota (17 recoveries)	Alabama	11.8	
	Arkansas	5.9	
	Illinois	5.9	
	Iowa	5.9	
	Louisiana	5.9	
	Minnesota	35.3	
	Ohio	5.9	
	Wisconsin	5.9	82.5
	Manitoba	11.8	
	Ontario	5.9	17.7
		100.2	100.2
Nebraska (23 recoveries)	Iowa	4.3	
	Louisiana	4.3	
	Tennessee	4.3	12.9
	Colorado	4.3	
	Kansas	8.7	
	Nebraska	30.4	
	Oklahoma	4.3	
	South Dakota	8.7	
	Texas	17.4	73.8
	Mexico	13.0	13.0
		99.7	99.7

Table 12.--Direct recoveries of gadwalls banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
North Dakota (97 recoveries)	Florida	1.0	
	Maryland	1.0	
	South Carolina	1.0	3.0
	Alabama	5.2	
	Arkansas	3.1	
	Illinois	3.1	
	Iowa	2.1	
	Louisiana	15.5	
	Michigan	1.0	
	Minnesota	4.1	
	Mississippi	2.1	
	Tennessee	1.0	
	Wisconsin	2.1	39.3
	Colorado	1.0	
	Nebraska	1.0	
	North Dakota	33.0	
	Oklahoma	1.0	
	South Dakota	4.1	
	Texas	11.3	51.4
	Manitoba	4.1	
	Ontario	1.0	5.1
	Mexico	1.0	1.0
		99.8	99.8
Oregon (24 recoveries)	Arizona	8.3	
	California	41.7	
	Idaho	8.3	
	Nevada	12.5	
	Oregon	25.0	
	Washington	4.2	
		100.0	100.0

Table 12.--Direct recoveries of gadwalls banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Percent of direct recoveries occurring in each Flyway
Saskatchewan (129 recoveries)	Florida	1.6	
	Georgia	0.8	
	North Carolina	1.6	
	Virginia	0.8	4.8
	Alabama	0.8	
	Arkansas	3.9	
	Illinois	1.6	
	Iowa	0.8	
	Louisiana	19.4	
	Michigan	0.8	
	Minnesota	2.3	
	Mississippi	0.8	
	Missouri	1.6	
	Ohio	0.8	
	Tennessee	1.6	34.4
	Colorado	1.6	
	Kansas	1.6	
	Montana	0.8	
	Nebraska	2.3	
	New Mexico	0.8	
	North Dakota	6.2	
	Oklahoma	2.3	
	South Dakota	2.3	
	Texas	17.1	
	Wyoming	0.8	35.8
	Utah	0.8	0.8
	Alberta	2.3	
	Saskatchewan	20.2	22.5
	Mexico	1.6	1.6
	Cuba	0.8	0.8
		100.7	100.7

Table 12.--Direct recoveries of gadwalls banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
South Dakota (118 recoveries)	Maryland	0.8	
	North Carolina	0.8	
	South Carolina	1.7	3.3
	Alabama	4.2	
	Arkansas	1.7	
	Illinois	5.1	
	Iowa	2.5	
	Louisiana	12.7	
	Minnesota	4.2	
	Mississippi	1.7	
	Missouri	0.8	
	Tennessee	2.5	
	Wisconsin	1.7	37.1
	Kansas	0.8	
	Nebraska	0.8	
	North Dakota	7.6	
	Oklahoma	1.7	
	South Dakota	38.1	
	Texas	8.5	57.5
	Mexico	1.7	1.7
		99.6	99.6
Utah (34 recoveries)	New Mexico	2.4	
	Texas	4.9	7.3
	Arizona	2.4	
	California	2.4	
	Utah	78.0	82.8
	Mexico	9.8	9.8
		99.9	99.9
Washington (58 recoveries)	California	19.0	
	Idaho	3.4	
	Oregon	19.0	
	Washington	56.9	98.3
	British Columbia	1.7	1.7
		100.0	100.0

Total Recoveries - 981

Table 13.--Direct recoveries of widgeons banded as locals by State or Province of recovery

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Percent of direct recoveries occurring in each Flyway
Alaska (151 recoveries)	Illinois	1.3	
	Louisiana	2.0	3.3
	Montana	0.7	
	North Dakota	0.7	
	South Dakota	0.7	2.1
	California	21.9	
	Idaho	3.3	
	Nevada	2.0	
	Oregon	14.6	
	Utah	0.7	
	Washington	21.9	64.4
	Alaska	6.6	6.6
	Alberta	5.3	
	British Columbia	15.9	
	Saskatchewan	0.7	
	Yukon	1.3	23.2
	Mexico	0.7	0.7
		100.3	100.3
Alberta (389 recoveries)	Maryland	0.5	
	North Carolina	0.5	
	Pennsylvania	0.3	1.3
	Arkansas	0.3	
	Illinois	0.5	
	Louisiana	1.3	
	Michigan	0.3	
	Minnesota	2.6	
	Missouri	0.3	
	Wisconsin	0.3	5.6

Table 13.--Direct recoveries of widgeons banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Alberta (con.)	Colorado	0.8	
	Kansas	0.3	
	Montana	2.8	
	Nebraska	0.5	
	North Dakota	0.5	
	Oklahoma	0.5	
	South Dakota	0.5	
	Texas	2.6	
	Wyoming	0.3	8.8
	Arizona	0.8	
	California	33.1	
	Idaho	4.4	
	Nevada	0.8	
	Oregon	11.3	
	Utah	2.8	
	Washington	6.7	59.9
	Alberta	19.3	
	British Columbia	1.0	
	Manitoba	0.5	
	Ontario	0.3	
	Saskatchewan	1.3	22.4
	Mexico	2.3	2.3
		100.3	100.3
British Columbia (140 recoveries)	Montana	0.7	
	Texas	0.7	1.4
	California	25.0	
	Idaho	0.7	
	Nevada	2.9	
	Oregon	27.1	
	Utah	0.7	
	Washington	23.6	80.0
	Alberta	0.7	
	British Columbia	17.9	18.6
		100.0	100.0

Table 13.--Direct recoveries of widgeons banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Percent of direct recoveries occurring in each Flyway
Colorado (17 recoveries)	Louisiana	6.0	6.0
	Colorado	23.5	
	Nebraska	6.0	
	New Mexico	17.6	
	Texas	6.0	53.1
	California	11.8	
	Utah	11.8	23.6
	Mexico	17.6	17.6
		100.3	100.3
Manitoba (57 recoveries)	Maryland	3.5	
	New Jersey	1.8	
	New York	3.5	
	North Carolina	1.8	
	Pennsylvania	1.8	
	Virginia	1.8	14.2
	Alabama	3.5	
	Arkansas	1.8	
	Illinois	3.5	
	Indiana	3.5	
	Iowa	3.5	
	Louisiana	1.8	
	Michigan	1.8	
	Minnesota	14.0	
	Tennessee	1.8	
	Wisconsin	5.3	40.5
	Kansas	1.8	
	North Dakota	5.3	
	Oklahoma	1.8	
	South Dakota	3.5	
	Texas	3.5	15.9
	Manitoba	22.8	
	Ontario	1.8	24.6

Table 13.--Direct recoveries of widgeons banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Manitoba (con.)	Cuba	1.8	
	Haiti-Dom. Rep.	1.8	
	Jamaica	1.8	5.4
		100.6	100.6
Minnesota (19 recoveries)	Florida	5.3	
	Maryland	5.3	
	North Carolina	5.3	15.9
	Louisiana	5.3	
	Minnesota	42.1	
	Wisconsin	31.6	79.0
	Ontario	5.3	5.3
		100.2	100.2
North Dakota (28 recoveries)	Illinois	7.1	
	Iowa	7.1	
	Minnesota	7.1	
	Missouri	3.6	
	Ohio	3.6	
	Tennessee	3.6	
	Wisconsin	3.6	35.7
	Kansas	7.1	
	North Dakota	25.0	
	Oklahoma	7.1	
	South Dakota	3.6	
	Texas	10.7	53.5
	Manitoba	7.1	7.1
	Lesser Antilles, BWI, FWI	3.6	3.6
		99.9	99.9

Table 13.--Direct recoveries of widgeons banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Saskatchewan (399 recoveries)	Delaware	0.5	
	Florida	1.5	
	Maryland	1.0	
	Massachusetts	0.3	
	New Jersey	0.5	
	New York	0.5	
	North Dakota	1.8	
	Pennsylvania	0.5	
	South Dakota	1.3	
	Virginia	1.0	8.9
	Alabama	1.0	
	Arkansas	1.8	
	Illinois	1.0	
	Iowa	1.3	
	Kentucky	0.3	
	Louisiana	4.0	
	Michigan	1.8	
	Minnesota	8.0	
	Mississippi	1.0	
	Missouri	2.0	
	Ohio	0.3	
	Tennessee	1.0	
	Wisconsin	5.3	28.8
	Colorado	0.3	
	Kansas	1.5	
	Montana	0.5	
	Nebraska	4.0	
	New Mexico	0.5	
	North Dakota	2.8	
	Oklahoma	1.8	
	South Dakota	2.8	
	Texas	8.5	22.7
	California	15.5	
	Idaho	0.5	
	Nevada	0.3	
	Oregon	0.8	
	Utah	1.3	
	Washington	1.0	19.4

Table 13.--Direct recoveries of widgeons banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Saskatchewan (con.)	Alberta	1.0	
	Manitoba	2.0	
	New Brunswick	0.3	
	Ontario	2.0	
	Saskatchewan	11.0	16.3
	British Honduras	0.3	
	Guatemala	0.3	
	Mexico	2.8	3.4
	Bahama Islands	0.3	
	Cuba	0.5	
	Haiti, Dom. Rep.	0.5	1.3
		100.8	100.8
South Dakota (10 recoveries)	Louisiana	10.0	10.0
	North Dakota	20.0	
	South Dakota	50.0	
	Texas	10.0	80.0
	Mexico	10.0	10.0
		100.0	100.0
Washington (72 recoveries)	Arizona	1.4	
	California	30.6	
	Idaho	8.3	
	Oregon	22.2	
	Washington	34.7	97.2
	British Columbia	2.8	2.8
		100.0	100.0

Total recoveries - 1282

Table 14.--Direct recoveries of blue-winged teals banded as locals by State or Province of recovery

State or Province as banded	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Alberta (170 recoveries)	Florida	1.8	1.8
	Louisiana	2.9	
	Michigan	0.6	
	Minnesota	1.8	
	Wisconsin	1.2	6.5
	Montana	0.6	
	Nebraska	2.9	
	North Dakota	1.8	
	Oklahoma	0.6	
	South Dakota	0.6	
	Texas	3.5	
	Wyoming	1.2	11.2
	California	0.6	
	Utah	0.6	1.2
	Alberta	42.4	
	Manitoba	1.2	
	Quebec	0.6	
	Saskatchewan	3.5	47.7
	Guatemala	0.6	
	Honduras	2.4	
	Mexico	19.4	
	Nicaragua	0.6	
	Panama	1.8	
	Salvador	0.6	25.4
	Colombia	3.5	
	Ecuador	0.6	
	Peru	0.6	4.7
	Cuba	1.2	
	Jamaica	0.6	1.8
		100.3	100.3
British Columbia (41 recoveries)	California	12.2	
	Utah	4.9	
	Washington	4.9	22.0

Table 14.--Direct recoveries of blue-winged teals banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
British Columbia (con.)	British Columbia	63.4	63.4
	Mexico	12.2	12.2
	Columbia	2.4	2.4
		100.0	100.0
Manitoba (127 recoveries)	Florida	2.4	2.4
	Iowa	2.4	
	Louisiana	5.5	
	Michigan	2.4	
	Minnesota	22.0	
	Missouri	0.8	
	Ohio	0.8	
	Wisconsin	7.9	41.8
	Nebraska	0.8	
	North Dakota	1.6	
	South Dakota	1.6	
	Texas	3.1	7.1
	Alberta	0.8	
	Manitoba	23.6	
	Ontario	3.1	
	Saskatchewan	0.8	28.3
	Guatemala	0.8	
	Honduras	2.4	
	Mexico	5.5	8.7
	Colombia	5.5	
	Ecuador	0.8	
	Peru	0.8	
	Venezuela	1.6	8.7
	Cuba	1.6	
	Haiti, Dom. Rep.	0.8	
	Jamaica	0.8	3.2
		100.2	100.2

Table 14.--Direct recoveries of blue-winged teals banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Minnesota (393 recoveries)	Florida	1.0	
	Georgia	0.3	
	Maine	0.5	
	Virginia	0.3	2.1
	Illinois	0.5	
	Iowa	1.5	
	Louisiana	2.8	
	Michigan	1.8	
	Minnesota	64.9	
	Missouri	0.8	
	Wisconsin	9.2	81.5
	Kansas	0.3	
	Nebraska	0.3	
	North Dakota	0.3	
	South Dakota	1.8	
	Texas	1.0	3.7
	Manitoba	0.5	
	Ontario	1.3	
	Quebec	1.3	3.1
	Mexico	1.5	1.5
	Brazil	0.3	
	Colombia	2.5	
	Guiana	1.3	
	Venezuela	0.7	4.8
	Bahama Islands	0.3	
	Cuba	1.0	
	Haita, Dom. Rep.	0.7	
	Jamaica	0.7	
	Lesser Antilles, BWI, FWI, Trinidad, Virgin Islands	0.7	3.4
		100.1	100.1

Table 14.--Direct recoveries of blue-winged teals banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Nebraska (172 recoveries)	Florida	0.6	0.6
	Illinois	1.2	
	Iowa	6.0	
	Louisiana	2.3	
	Michigan	0.6	
	Minnesota	16.9	
	Mississippi	0.6	
	Missouri	1.7	
	Wisconsin	5.2	34.5
	Colorado	0.6	
	Kansas	0.6	
	Nebraska	11.0	
	North Dakota	2.3	
	Oklahoma	1.2	
	South Dakota	16.9	
	Texas	5.2	37.8
	Ontario	0.6	0.6
	Costa Rica	1.2	
	Guatemala	1.7	
	Mexico	10.5	
	Nicaragua	0.6	
	Panama	3.5	17.5
	Colombia	5.2	
	Ecuador	0.6	
	Peru	1.2	7.0
	Bahama Islands	0.6	
	Cuba	1.2	1.8
		99.8	99.8
North Dakota (267 recoveries)	Unknown	0.4	0.4
	Florida	1.1	
	South Carolina	0.4	1.5

Table 14.--Direct recoveries of blue-winged teals banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
North Dakota (con.)	Illinois	0.4	
	Iowa	3.0	
	Kentucky	0.4	
	Louisiana	4.9	
	Michigan	1.1	
	Minnesota	23.2	
	Missouri	0.7	
	Wisconsin	4.1	37.8
	Colorado	0.7	
	Kansas	3.0	
	Nebraska	7.5	
	North Dakota	19.1	
	Oklahoma	0.7	
	South Dakota	6.0	
	Texas	2.6	39.6
	Manitoba	1.1	
	Ontario	0.7	
	Quebec	0.4	
	Saskatchewan	0.4	2.6
	Costa Rica	1.1	
	Guatemala	0.4	
	Mexico	3.0	
	Nicaragua	0.4	
	Panama	2.6	7.5
	Colombia	6.0	
	Guiana	0.7	
	Peru	0.7	
	Venezuela	1.5	8.9
	Bahama Islands	0.4	
	Cuba	0.7	
	Jamaica	0.4	1.5
		99.8	99.8

Table 14.--Direct recoveries of blue-winged teals banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Saskatchewan (233 recoveries)	Florida	0.9	
	Maine	0.4	
	South Carolina	0.4	1.7
	Arkansas	0.4	
	Iowa	3.4	
	Louisiana	5.6	
	Michigan	1.7	
	Minnesota	12.4	
	Mississippi	0.4	
	Missouri	0.4	
	Ohio	0.9	
	Tennessee	0.4	
	Wisconsin	5.6	31.2
	Kansas	1.3	
	Nebraska	2.6	
	New Mexico	0.4	
	North Dakota	1.7	
	Oklahoma	0.4	
	South Dakota	2.6	
	Texas	3.9	12.9
	California	0.4	0.4
	Alberta	0.9	
	Manitoba	3.4	
	New Brunswick	1.3	
	Ontario	1.3	
	Quebec	0.9	
	Saskatchewan	18.0	25.8
	Honduras	0.4	
	Guatemala	0.4	
	Mexico	10.7	
	Nicaragua	0.9	
	Panama	3.4	15.8
	Colombia	6.4	
	Ecuador	0.9	
	Guiana	0.9	
	Venezuela	0.9	7.1

Table 14.--Direct recoveries of blue-winged teals banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Saskatchewan (con.)	Cuba	2.6	
	Lesser Antilles, BWI, FWI, Trinidad, Virgin Islands	0.4	3.0
		99.9	99.9
South Dakota (481 recoveries)	Florida	0.8	
	Maine	0.2	
	Massachusetts	0.2	
	New York	0.2	1.4
	Alabama	0.4	
	Arkansas	0.4	
	Illinois	0.6	
	Iowa	4.2	
	Louisiana	4.8	
	Michigan	0.8	
	Minnesota	24.9	
	Missouri	0.6	
	Ohio	0.2	
	Wisconsin	8.3	45.2
	Kansas	0.8	
	Nebraska	1.5	
	North Dakota	2.3	
	South Dakota	26.8	
	Texas	3.3	34.7
	Manitoba	0.4	
	Ontario	0.2	
	Quebec	0.2	
	Saskatchewan	0.4	1.2
	Honduras	0.4	
	Mexico	3.5	
	Nicaragua	0.4	
	Panama	2.7	7.0

Table 14.--Direct recoveries of blue-winged teals banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
South Dakota (con.)	Colombia	4.4	
	Ecuador	0.2	
	Peru	0.2	
	Venezuela	2.0	6.8
	Cuba	2.0	
	Haiti, Dom. Rep.	0.4	
	Jamaica	0.4	
	Lesser Antilles & Virgin Islands	0.2	3.0
		99.3	99.3

Total recoveries - 1884

Table 15.--Direct recoveries of shovelers banded as locals by State or Province of recovery.

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Alaska (45 recoveries)	Montana	2.2	2.2
	California	55.6	
	Idaho	2.2	
	Oregon	4.4	
	Washington	6.7	68.9
	Alaska	17.8	17.8
	British Columbia	6.7	6.7
	Mexico	4.4	4.4
		100.0	100.0
Alberta (390 recoveries)	Arkansas	0.3	
	Iowa	0.3	
	Louisiana	1.5	
	Missouri	0.3	2.4
	Colorado	0.8	
	Kansas	0.3	
	Montana	0.5	
	Nebraska	0.5	
	North Dakota	0.3	
	Oklahoma	0.3	
	South Dakota	0.3	
	Texas	4.6	
	Wyoming	0.8	8.4
	Arizona	2.8	
	California	44.4	
	Idaho	1.0	
	Nevada	2.3	
	Oregon	2.0	
	Utah	4.6	
	Washington	2.3	59.4
	Alberta	22.8	
	British Columbia	0.3	
	Saskatchewan	1.0	24.1
	Mexico	5.9	5.9
		100.2	100.2

Table 15.--Direct recoveries of shovelers banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
British Columbia (18 recoveries)	California	50.0	
	Oregon	11.0	
	Washington	16.7	77.7
	British Columbia	22.2	22.2
		99.9	99.9
Manitoba (47 recoveries)	Arkansas	2.1	
	Illinois	2.1	
	Kentucky	2.1	
	Louisiana	6.4	
	Minnesota	10.6	
	Missouri	4.3	27.6
	Kansas	6.4	
	North Dakota	2.1	
	South Dakota	6.4	
	Texas	19.1	34.0
	California	4.2	4.2
	Manitoba	21.3	
	New Brunswick	2.1	
	Saskatchewan	6.4	29.8
	Mexico	4.2	4.2
		99.8	99.8
Minnesota (14 recoveries)	Iowa	7.1	
	Louisiana	7.1	
	Minnesota	57.1	71.3
	North Dakota	14.3	
	South Dakota	14.3	28.6
		99.9	99.9
North Dakota (64 recoveries)	Florida	3.1	3.1
	Arkansas	3.1	
	Illinois	1.6	
	Iowa	4.7	
	Louisiana	7.8	
	Minnesota	15.6	
	Missouri	6.2	
	Tennessee	1.6	40.6

Table 15.--Direct recoveries of shovelers banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
North Dakota (con.)	Kansas	1.6	
	Nebraska	1.6	
	North Dakota	31.2	
	Oklahoma	4.7	
	South Dakota	6.2	
	Texas	6.2	51.5
	Manitoba	1.6	1.6
	Mexico	3.1	3.1
		99.9	99.9
Saskatchewan (285 recoveries)	Florida	0.4	
	South Carolina	1.0	1.4
	Illinois	1.0	
	Iowa	0.7	
	Louisiana	4.9	
	Minnesota	2.5	
	Missouri	1.4	
	Tennessee	0.4	
	Wisconsin	0.4	11.3
	Colorado	1.0	
	Kansas	5.3	
	Montana	0.7	
	Nebraska	2.1	
	New Mexico	0.4	
	North Dakota	3.5	
	Oklahoma	3.9	
	South Dakota	1.0	
	Texas	16.5	34.4
	Arizona	0.4	
	California	13.3	
	Nevada	2.1	
	Oregon	1.0	
	Utah	2.5	19.3
	Alberta	5.0	
	Manitoba	0.7	
	Saskatchewan	19.6	25.3

Table 15.--Direct recoveries of shovelers banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Saskatchewan (con.)	Guatemala	0.4	
	Hondura	0.4	
	Mexico	7.0	
	Salvador	0.7	8.5
		100.2	100.2
South Dakota (48 recoveries)	Maryland	1.2	1.2
	Illinois	1.2	
	Indiana	1.2	
	Iowa	3.7	
	Louisiana	9.8	
	Michigan	1.2	
	Minnesota	11.0	
	Missouri	2.4	
	Tennessee	3.7	
	Wisconsin	2.4	36.6
	Kansas	2.4	
	Nebraska	2.4	
	North Dakota	9.8	
	Oklahoma	3.7	
	South Dakota	28.0	
	Texas	12.2	58.5
	Manitoba	1.2	1.2
	Mexico	1.2	1.2
	Cuba	1.2	1.2
		99.9	99.9
Washington (40 recoveries)	California	82.5	
	Nevada	2.5	
	Oregon	7.5	
	Washington	7.5	100.0
		100.0	100.0

Total recoveries - 951

Table 16.--Direct recoveries of pintails banded as locals by State or Province of recovery

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Alaska (118 recoveries)	North Carolina	0.8	
	South Carolina	0.8	1.6
	Montana	0.8	
	Oklahoma	0.8	
	Texas	2.5	4.1
	California	24.6	
	Idaho	3.4	
	Oregon	14.4	
	Utah	1.7	
	Washington	13.6	57.7
	Alaska	13.6	13.6
	Alberta	5.9	
	British Columbia	16.1	22.0
	Mexico	0.8	0.8
		99.8	99.8
Alberta (735 recoveries)	Arkansas	0.1	
	Illinois	0.1	
	Iowa	0.1	
	Louisiana	1.0	
	Minnesota	0.3	
	Missouri	0.1	
	Ohio	0.1	1.8
	Colorado	0.8	
	Kansas	0.7	
	Montana	1.2	
	Nebraska	0.8	
	North Dakota	0.1	
	Oklahoma	0.1	
	South Dakota	0.4	
	Texas	2.9	
	Wyoming	0.4	7.4
	Arizona	0.7	
	California	51.7	
	Idaho	0.7	
	Nevada	1.0	
	Oregon	5.2	
	Utah	1.9	
	Washington	1.6	62.8

Table 16.--Direct recoveries of pintails banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Alberta (con.)	Alberta	23.0	
	British Columbia	0.7	
	Saskatchewan	0.7	24.4
	Mexico	3.1	
	Panama	0.1	
	Salvador	0.1	3.3
	Colombia	0.1	0.1
		99.8	99.8
British Columbia (15 recoveries)	California	26.7	
	Oregon	26.7	
	Utah	6.7	
	Washington	20.0	80.1
	British Columbia	13.3	13.3
	Panama	6.7	6.7
		100.1	100.1
California (58 recoveries)	Nebraska	3.4	
	South Dakota	1.7	
	Texas	1.7	6.8
	California	89.7	
	Nevada	1.7	91.4
	Mexico	1.7	1.7
		99.9	99.9
Manitoba (33 recoveries)	Maryland	3.0	3.0
	Arkansas	3.0	
	Illinois	3.6	
	Louisiana	6.1	
	Minnesota	3.0	
	Ohio	3.0	18.7
	Colorado	3.0	
	Kansas	3.0	
	North Dakota	9.1	
	Oklahoma	3.0	
	Texas	3.0	21.1

Table 16.--Direct recoveries of pintails banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Manitoba (con.)	California	12.1	
	Utah	3.0	15.1
	Manitoba	33.3	
	Saskatchewan	3.0	36.3
	Panama	3.0	3.0
	Haiti, Dom. Rep.	3.0	3.0
		100.2	100.2
Minnesota (46 recoveries)	Delaware	2.2	
	Florida	2.2	
	North Carolina	2.2	6.6
	Arkansas	2.2	
	Illinois	8.7	
	Michigan	2.2	
	Minnesota	41.3	
	Missouri	2.2	
	Ohio	2.2	
	Wisconsin	8.7	67.5
	Kansas	2.2	
	Nebraska	2.2	
	North Dakota	2.2	
	Oklahoma	2.2	
	South Dakota	8.7	
	Texas	4.3	21.8
	Manitoba	2.2	
	Ontario	2.2	4.4
		100.3	100.3
Montana (28 recoveries)	Minnesota	10.7	
	Missouri	3.6	14.3
	Nebraska	3.6	
	North Dakota	14.3	
	Texas	32.1	
	Wyoming	3.6	53.6

Table 16.--Direct recoveries of pintails banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Montana (con.)	California	28.6	28.6
	Mexico	3.6	3.6
		100.1	100.1
Nebraska (21 recoveries)	Illinois	9.5	
	Iowa	9.5	
	Louisiana	4.8	
	Minnesota	9.5	
	Wisconsin	4.8	38.1
	Nebraska	23.8	
	South Dakota	9.5	
	Texas	23.8	57.1
	Mexico	4.8	4.8
		100.0	100.0
North Dakota (73 recoveries)	Iowa	1.4	
	Louisiana	11.0	
	Minnesota	8.2	
	Missouri	2.7	
	Tennessee	1.4	24.7
	Kansas	8.2	
	North Dakota	46.6	
	Oklahoma	4.1	
	South Dakota	4.1	
	Texas	4.1	67.1
	California	4.1	
	Utah	1.4	5.5
	Manitoba	1.4	1.4
	Cuba	1.4	1.4
		100.1	100.1

Table 16.--Direct recoveries of pintails banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Saskatchewan (456 recoveries)	Florida	0.2	0.2
	Alabama	0.2	
	Illinois	0.9	
	Iowa	0.7	
	Louisiana	3.7	
	Minnesota	0.9	
	Mississippi	0.2	
	Missouri	1.1	
	Ohio	0.2	
	Tennessee	0.2	
	Wisconsin	0.2	8.3
	Colorado	0.7	
	Kansas	2.4	
	Montana	0.2	
	Nebraska	2.8	
	New Mexico	0.2	
	North Dakota	2.8	
	Oklahoma	1.1	
	South Dakota	1.8	
	Texas	9.2	21.2
	Arizona	0.2	
	California	35.7	
	Idaho	1.1	
	Nevada	0.9	
	Oregon	1.5	
	Utah	1.5	
	Washington	0.2	41.1
	Alberta	1.8	
	British Columbia	0.2	
	Manitoba	0.2	
	Saskatchewan	19.3	21.5
	Mexico	6.8	
	Panama	0.7	7.5
		99.8	99.8

Table 16.--Direct recoveries of pintails banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
South Dakota (249 recoveries)	Marshall Islands	0.4	
	Midway Islands	0.4	0.8
	Florida	0.4	
	North Carolina	1.2	
	Pennsylvania	0.4	
	South Carolina	0.4	2.4
	Alabama	0.4	
	Arkansas	1.6	
	Illinois	4.0	
	Iowa	2.4	
	Louisiana	8.0	
	Minnesota	9.6	
	Missouri	2.4	
	Tennessee	0.8	
	Wisconsin	2.0	31.2
	Colorado	0.8	
	Kansas	2.0	
	Montana	0.4	
	Nebraska	2.4	
	North Dakota	8.0	
	Oklahoma	1.2	
	South Dakota	24.1	
	Texas	14.5	53.4
	California	4.0	
	Nevada	0.8	
	Oregon	0.4	
	Utah	0.4	5.6
	Manitoba	0.8	0.8
	Mexico	5.2	
	Panama	0.4	5.6
		99.8	99.8
Washington (27 recoveries)	California	48.1	
	Oregon	18.5	
	Washington	33.3	99.9
		99.9	99.9

Total recoveries - 1859

Table 17.--Direct recoveries of redheads banded as locals by State or Province of recovery

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Alberta (48 recoveries)	Florida	2.1	2.1
	Michigan	2.1	
	Minnesota	6.2	
	Ohio	2.1	10.4
	Kansas	2.1	
	New Mexico	2.1	
	Oklahoma	8.3	
	South Dakota	8.3	
	Texas	16.7	
	Wyoming	2.1	39.6
	California	4.2	4.2
	Alberta	37.5	
	Ontario	2.1	39.6
	Mexico	4.2	4.2
		100.1	100.1
British Columbia (70 recoveries)	Montana	2.9	
	Texas	8.6	11.5
	Arizona	2.9	
	California	8.6	
	Idaho	4.3	
	Oregon	5.7	
	Washington	10.0	31.5
	Alberta	1.4	
	British Columbia	51.4	52.8
	Mexico	4.3	4.3
		100.1	100.1
California (499 recoveries)	Virginia	0.2	0.2
	Colorado	0.2	
	Nebraska	0.2	
	New Mexico	0.4	
	Texas	5.4	
	Wyoming	0.2	6.4

Table 17.--Direct recoveries of redheads banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
California (con.)	Arizona	2.0	
	California	57.3	
	Idaho	1.4	
	Nevada	5.0	
	Oregon	20.4	
	Utah	1.0	
	Washington	1.0	88.1
	Mexico	5.2	5.2
		99.9	99.9
Manitoba (216 recoveries)	Maryland	3.7	
	North Carolina	0.9	
	Pennsylvania	1.4	
	South Carolina	0.5	
	Virginia	1.4	7.9
	Alabama	0.9	
	Illinois	1.4	
	Iowa	1.9	
	Louisiana	4.2	
	Michigan	10.6	
	Minnesota	13.0	
	Mississippi	0.5	
	Ohio	0.5	
	Tennessee	0.5	
	Wisconsin	4.6	38.1
	Kansas	0.5	
	Nebraska	0.5	
	North Dakota	2.8	
	Oklahoma	2.8	
	South Dakota	2.8	
	Texas	5.6	15.0
	Manitoba	32.9	
	Ontario	6.5	39.4
		100.4	100.4

Table 17.--Direct recoveries of redheads banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Minnesota (205 recoveries)	Florida	0.5	
	Maryland	3.4	
	New Jersey	0.5	
	North Carolina	0.5	
	Pennsylvania	0.5	
	South Carolina	0.5	
	Virginia	1.5	7.4
	Alabama	0.5	
	Arkansas	0.5	
	Illinois	0.5	
	Indiana	0.5	
	Louisiana	1.0	
	Michigan	5.4	
	Minnesota	62.4	
	Missouri	0.5	
	Tennessee	0.5	
	Wisconsin	4.9	76.7
	Nebraska	1.0	
	Oklahoma	1.5	
	South Dakota	2.4	
	Texas	2.9	7.8
	Manitoba	2.0	
	Ontario	6.3	8.3
		100.2	100.2
Montana (37 recoveries)	Louisiana	2.7	
	Michigan	2.7	
	Minnesota	10.8	16.2
	Colorado	5.4	
	Kansas	10.8	
	Montana	5.4	
	Nebraska	8.1	
	North Dakota	2.7	
	Oklahoma	8.1	
	South Dakota	5.4	
	Texas	21.6	
	Wyoming	2.7	70.2

Table 17.--Direct recoveries of redheads banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Montana (con.)	California	2.7	
	Idaho	2.7	5.4
	Manitoba	2.7	
	Saskatchewan	5.4	8.1
		99.9	99.9
Nebraska (16 recoveries)	Louisiana	6.2	
	Michigan	12.5	
	Minnesota	6.2	
	Wisconsin	6.2	31.1
	Nebraska	18.8	
	North Dakota	18.8	
	South Dakota	6.2	
	Texas	18.8	62.6
	Mexico	6.2	6.2
		99.9	99.9
Nevada (373 recoveries)	Colorado	0.5	
	Kansas	0.3	
	Montana	0.8	
	Nebraska	0.3	
	New Mexico	0.3	
	Oklahoma	0.3	
	Texas	4.3	
	Wyoming	0.5	7.3
	Arizona	1.9	
	California	13.1	
	Idaho	2.1	
	Nevada	63.8	
	Oregon	2.1	
	Utah	5.4	
	Washington	0.3	88.7
	Mexico	4.0	4.0
		100.0	100.0

Table 17.--Direct recoveries of redheads banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Percent of direct recoveries occurring in each Flyway
New York (10 recoveries)	Maryland	10.0	
	New Jersey	10.0	
	New York	10.0	
	North Carolina	10.0	40.0
	Ontario	60.0	60.0
		100.0	100.0
North Dakota (67 recoveries)	Florida	1.5	
	Maryland	3.0	
	New York	1.5	6.0
	Arkansas	1.5	
	Illinois	1.5	
	Iowa	1.5	
	Louisiana	4.5	
	Michigan	6.0	
	Minnesota	11.9	
	Mississippi	1.5	
	Missouri	1.5	
	Wisconsin	4.5	34.4
	Kansas	1.5	
	Nebraska	4.5	
	North Dakota	37.3	
	South Dakota	6.0	
	Texas	3.0	
	Wyoming	1.5	53.8
	Ontario	6.0	6.0
		100.2	100.2
Oregon (38 recoveries)	Kansas	2.6	
	Texas	5.3	7.9
	California	7.9	
	Nevada	7.9	
	Oregon	63.2	
	Utah	5.3	84.3
	Mexico	7.9	7.9
		100.1	100.1

Table 17.--Direct recoveries of redheads banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Saskatchewan (69 recoveries)	Florida	1.4	
	Maryland	4.3	
	North Carolina	2.9	
	Virginia	4.3	12.9
	Iowa	2.9	
	Michigan	1.4	
	Minnesota	8.7	
	Mississippi	1.4	
	Missouri	1.4	
	Ohio	2.9	
	Wisconsin	5.8	24.5
	Kansas	4.3	
	Nebraska	2.9	
	North Dakota	4.3	
	South Dakota	2.9	
	Texas	8.7	23.1
	Manitoba	4.3	
	Ontario	10.1	
	Saskatchewan	24.6	39.0
		99.5	99.5
South Dakota (86 recoveries)	Pennsylvania	1.2	1.2
	Arkansas	1.2	
	Louisiana	3.5	
	Michigan	4.7	
	Minnesota	25.6	
	Mississippi	1.2	36.2
	Kansas	1.2	
	Nebraska	1.2	
	North Dakota	9.3	
	Oklahoma	1.2	
	South Dakota	41.9	
	Texas	4.7	59.5
	Manitoba	1.2	
	Ontario	2.3	3.5
		100.4	100.4

Table 17.--Direct recoveries of redheads banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Utah (347 recoveries)	District of Columbia	0.3	0.3
	Colorado	2.0	
	Kansas	0.9	
	Montana	0.3	
	Nebraska	0.3	
	New Mexico	0.9	
	Oklahoma	0.6	
	Texas	8.9	
	Wyoming	0.9	14.8
	Arizona	2.0	
	California	4.0	
	Idaho	0.9	
	Nevada	1.2	
	Oregon	0.3	
	Utah	67.7	
	Washington	0.3	76.4
	British Columbia	0.3	0.3
	Mexico	8.4	8.4
		100.2	100.2

Total recoveries - 2081

Table 18.--Direct recoveries of canvasbacks banded as locals by State or Province of recovery

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Percent of direct recoveries occurring in each Flyway
Alaska (35 recoveries)	Maryland	2.9	
	North Carolina	2.9	5.8
	California	20.0	
	Oregon	17.1	
	Utah	2.9	
	Washington	28.6	68.6
	Alaska	5.7	5.7
	British Columbia	11.4	
	Ontario	5.7	17.1
	Mexico	2.9	2.9
		100.1	100.1
Alberta (30 recoveries)	Virginia	6.7	6.7
	Alabama	3.3	
	Michigan	3.3	6.6
	New Mexico	3.3	
	Texas	10.0	13.3
	California	26.7	
	Nevada	6.7	
	Utah	3.3	36.7
	Alberta	26.7	
	Ontario	3.3	
	Saskatchewan	3.3	33.3
	Mexico	3.3	3.3
		99.9	99.9
British Columbia (25 recoveries)	Maryland	4.0	
	Pennsylvania	4.0	8.0
	California	36.0	
	Oregon	20.0	
	Washington	20.0	76.0
	British Columbia	16.0	16.0
		100.0	100.0

Table 18.--Direct recoveries of canvasbacks banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Manitoba (164 recoveries)	Florida	0.6	
	Georgia	0.6	
	Maryland	14.6	
	New York	0.6	
	North Carolina	1.8	
	Virginia	3.0	21.2
	Illinois	1.8	
	Louisiana	0.6	
	Michigan	4.3	
	Minnesota	10.4	
	Missouri	0.6	
	Ohio	0.6	
	Tennessee	0.6	
	Wisconsin	7.3	26.2
	Nebraska	1.8	
	North Dakota	3.0	
	South Dakota	3.0	
	Texas	2.4	
	Wyoming	0.6	10.8
	California	1.2	1.2
	Manitoba	29.9	
	Ontario	6.7	
	Saskatchewan	3.0	39.6
	Mexico	0.6	0.6
		99.6	99.6
Minnesota (107 recoveries)	Maryland	11.2	
	New Jersey	0.9	
	Virginia	2.8	14.9
	Illinois	0.9	
	Iowa	1.9	
	Louisiana	0.9	
	Michigan	3.7	
	Minnesota	42.0	
	Wisconsin	12.1	61.5
	New Mexico	2.2	
	North Dakota	20.0	
	South Dakota	11.1	
	Texas	6.7	

Table 18.--Direct recoveries of canvasbacks banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Minnesota (con.)	Manitoba	8.4	
	Ontario	1.9	10.3
	Nicaragua	0.9	0.9
		99.7	99.7
North Dakota (45 recoveries)	Maryland	6.7	
	North Carolina	2.2	
	Pennsylvania	2.2	
	Virginia	4.4	15.5
	Iowa	6.7	
	Michigan	2.2	
	Minnesota	15.6	
	Wisconsin	8.9	33.4
	New Mexico	2.2	
	North Dakota	20.0	
	South Dakota	11.1	
	Texas	6.7	40.0
	Manitoba	2.2	
	Ontario	6.7	8.9
	Mexico	2.2	2.2
		100.0	100.0
Saskatchewan (176 recoveries)	Florida	1.1	
	Maryland	6.8	
	New York	3.4	
	North Carolina	1.1	
	Virginia	1.1	13.5
	Alabama	1.1	
	Arkansas	0.6	
	Illinois	2.3	
	Iowa	2.3	
	Kentucky	0.6	
	Louisiana	1.1	
	Michigan	4.0	
	Minnesota	4.5	
	Tennessee	1.1	
	Wisconsin	2.8	20.4

Table 18.--Direct recoveries of canvasbacks banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Saskatchewan (con.)	Nebraska	1.1	
	North Dakota	5.7	
	Oklahoma	1.7	
	South Dakota	3.4	
	Texas	9.0	
	Wyoming	0.6	21.5
	Arizona	0.6	
	California	4.5	
	Idaho	0.6	
	Oregon	0.6	6.3
	Manitoba	6.8	
	Ontario	5.7	
	Saskatchewan	22.2	34.7
	Mexico	3.4	3.4
		99.8	99.8
South Dakota (27 recoveries)	New York	3.7	
	Virginia	3.7	7.4
	Louisiana	3.7	
	Michigan	7.4	
	Minnesota	14.8	
	Missouri	3.7	
	Ohio	3.7	
	Wisconsin	3.7	37.0
	Colorado	3.7	
	North Dakota	14.8	
	South Dakota	25.9	
	Texas	7.4	51.8
	Ontario	3.7	3.7
		99.9	99.9

Total recoveries - 609

Table 19.--Direct recoveries of lesser scaups banded as locals by State or Province of recovery

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Alaska (82 recoveries)	Florida	2.4	
	New Jersey	1.2	3.6
	Iowa	1.2	
	Louisiana	14.6	
	Michigan	3.6	
	Minnesota	3.6	
	Wisconsin	1.2	24.2
	Kansas	2.4	
	Montana	2.4	
	North Dakota	1.2	
	Oklahoma	2.4	
	Texas	12.2	20.6
	California	13.4	
	Washington	6.1	19.5
	Alaska	8.5	8.5
	Alberta	1.2	
	British Columbia	7.3	
	Manitoba	1.2	
	Ontario	4.9	
	Saskatchewan	3.6	18.2
	Mexico	3.6	
	Panama	1.2	4.8
		99.4	99.4
Alberta (577 recoveries)	Florida	1.4	
	Maryland	0.2	
	New York	0.3	
	Rhode Island	0.2	
	South Carolina	0.2	
	Virginia	0.3	2.6

Table 19.--Direct recoveries of lesser scaups banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Alberta (con.)	Alabama	0.5	
	Arkansas	0.2	
	Illinois	0.9	
	Indiana	0.2	
	Iowa	1.6	
	Kentucky	0.2	
	Louisiana	11.3	
	Michigan	0.5	
	Minnesota	18.4	
	Mississippi	0.5	
	Missouri	2.9	
	Tennessee	0.2	
	Wisconsin	2.4	39.8
	Colorado	0.5	
	Kansas	3.6	
	Montana	0.7	
	Nebraska	0.9	
	New Mexico	0.2	
	North Dakota	2.3	
	Oklahoma	4.0	
	South Dakota	2.3	
	Texas	13.0	
	Wyoming	0.3	27.8
	California	5.4	
	Idaho	0.2	
	Nevada	0.2	
	Oregon	0.3	
	Utah	0.3	
	Washington	0.2	6.6
	Alberta	10.6	
	Manitoba	2.3	
	Ontario	2.3	
	Quebec	0.3	
	Saskatchewan	1.6	17.1
	Mexico	6.1	
	Salvador	0.2	6.3
	Cuba	0.2	0.2
		100.4	100.4

Table 19.--Direct recoveries of lesser scaups banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
British Columbia (260 recoveries)	Illinois	0.4	
	Louisiana	0.8	
	Ohio	0.4	1.6
	Montana	0.4	
	Nebraska	0.8	
	North Dakota	0.4	
	Texas	1.9	3.5
	Arizona	0.4	
	California	36.5	
	Idaho	1.2	
	Nevada	1.2	
	Oregon	7.3	
	Washington	13.8	60.4
	Alberta	1.9	
	British Columbia	30.0	
	Saskatchewan	0.4	32.3
	Mexico	2.3	2.3
		100.1	100.1
California (21 recoveries)	California	76.2	
	Oregon	9.5	85.7
	Mexico	14.3	14.3
		100.0	100.0
Mackenzie (29 recoveries)	Florida	6.9	6.9
	Arkansas	3.4	
	Louisiana	17.2	
	Minnesota	17.2	
	Wisconsin	6.9	44.7
	Kansas	10.3	
	Texas	17.2	27.5
	Mackenzie	6.9	
	Manitoba	10.3	
	Ontario	3.4	20.6
		99.7	99.7

Table 19.--Direct recoveries of lesser scaups banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Percent of direct recoveries occurring in each Flyway
Manitoba (19 recoveries)	Florida	5.3	5.3
	Illinois	5.3	
	Iowa	5.3	
	Louisiana	15.8	
	Minnesota	15.8	
	Wisconsin	5.3	47.5
	Texas	10.5	10.5
	Manitoba	26.3	
	Ontario	5.3	
	Saskatchewan	5.3	36.9
		100.2	100.2
North Dakota (19 recoveries)	Louisiana	5.3	
	Minnesota	21.0	26.3
	North Dakota	57.9	
	South Dakota	15.8	73.7
		100.0	100.0
Saskatchewan (152 recoveries)	Florida	4.6	
	Georgia	0.7	
	Pennsylvania	0.7	
	South Carolina	0.7	6.7
	Alabama	1.3	
	Arkansas	0.7	
	Illinois	1.3	
	Indiana	0.7	
	Iowa	0.7	
	Louisiana	15.8	
	Minnesota	11.2	
	Mississippi	1.3	
	Missouri	3.9	
	Tennessee	0.7	
	Wisconsin	3.9	41.5
	Kansas	4.6	
	Montana	0.7	
	Nebraska	0.7	
	North Dakota	0.7	
	Oklahoma	7.2	
	South Dakota	1.3	
	Texas	11.2	26.4

Table 19.--Direct recoveries of lesser scaups banded as locals by State or Province of recovery--continued

State or Province of banding	State or Province of recovery	Percent of direct recoveries occurring in each State or Province	Flyway
Saskatchewan (con.)	California	0.7	0.7
	Manitoba	4.6	
	Ontario	3.9	
	Saskatchewan	11.2	19.7
	Honduras	0.7	
	Mexico	4.6	5.3
		100.3	100.3

Total recoveries - 1159

Table 20.--Comparison of direct recovery rates from trapped and dog-caught mallards, 1950-1961. 1/

Area of banding	Method of capture					
	Trapped			Dog-caught		
	Number banded	Number recov.	Percent recov.	Number banded	Number recov.	Percent recov.
Alberta	8,496	841	9.9	2,294	182	7.9
Manitoba	1,881	274	14.6	617	71	11.5
Saskatchewan	16,564	1,644	9.9	19,448	1,588	8.2
Washington	2,288	271	11.8	597	76	12.7
Total	29,229	3,030	10.4	22,956	1,917	8.4

1/ All dog-caught birds reported to be injured in any degree are excluded.

Table 21.--Comparison of the distribution of the mallard population in 1961 with the distribution of bandings of mallard "locals" for all prior years as reflected by the recoveries available for analysis

Region	Population Index 1/ in percent	Recoveries in 4/ percent
Alaska	2.7	0.5
N. E. British Columbia, N. Alberta, Yukon & Northwest Territories 2/	27.7	0.9
Southern Albera	21.6	14.3
N. Saskatchewan, N. Manitoba, & W. Ontario	5.6	0.1
S. Saskatchewan	29.0	49.0
S. W. Manitoba	5.4	4.2
Dakotas & W. Minnesota	6.5	14.3
Montana	0.6	0.5
Nebraska	0.7	1.2
Other Areas 3/		15.0
Total percent	99.8	100.0

1/ Data from 1961 breeding population surveys.

2/ Nearly all recoveries are from bandings in southern fringe of the area.

3/ Areas not covered by breeding population surveys; the production of this area is relatively insignificant.

4/ Percentages are based on total direct recoveries for all years.

Table 22.--Mallard bandings and recoveries by reference area, 1950-1961

Reference Area	Bandings			Recoveries					
				Direct			Indirect		
	Male	Female	Total 1/	Male	Female	Total	Male	Female	Total
I. Northern Pacific									
Alaska	161	148	335	15	17	34	9	0	9
British Columbia	133	134	798	25	26	141	6	4	32
	294	282	1133	40	43	175	15	4	41
II. Western United States									
Washington	630	565	2885	83	57	347	21	9	143
Oregon	139	129	347	29	27	61	6	3	11
California	633	513	1146	93	57	150	34	11	45
Idaho	75	97	192	10	10	27	2	1	3
Nevada	37	26	157	5	3	9	2	3	10
Utah	104	124	228	10	14	24	8	5	13
Arizona	0	1	1	0	0	0	0	0	0
	1618	1455	4956	230	168	618	73	32	225
III. Western Interior Canada									
Northwest Territories	53	55	109	3	6	9	1	0	1
S. W. Alberta	2305	2173	4499	250	178	428	136	105	241
S. E. Alberta	3401	2995	6437	356	253	612	188	105	298
S. W . Saskatchewan	10343	10004	20391	924	777	1704	114	97	211
	16102	15227	31436	1533	1214	2753	439	307	751

Table 22.--Mallard bandings and recoveries by reference area, 1950-1961--continued

Reference Area	Bandings			Recoveries					
				Direct			Indirect		
	Male	Female	Total[1/]	Male	Female	Total	Male	Female	Total
IV. Northern Plains									
S. E. Saskatchewan	8694	8462	17195	920	743	1666	410	285	697
S. W. Manitoba	1192	1156	2353	167	163	332	82	54	136
W. Montana	33	29	63	0	3	3	1	0	1
E. Montana	243	249	499	21	12	34	17	11	28
North Dakota	595	575	1174	95	55	150	43	21	65
South Dakota	1283	1250	2539	202	180	383	94	86	181
	12040	11721	23823	1405	1156	2568	647	457	1108
V. West-central United States									
Wyoming	29	28	57	5	4	9	1	1	2
Colorado	516	504	1080	40	44	88	21	17	39
Nebraska	332	309	648	47	34	81	13	14	27
Kansas	7	3	10	0	0	0	0	1	1
New Mexico	32	24	96	3	0	5	2	2	4
	916	868	1891	95	82	183	37	35	73
VI. Eastern Prairie and Great Lakes									
N. E. Manitoba	5	1	6	0	0	0	1	0	1
S. E. Manitoba	59	67	139	5	4	11	0	0	0
Minnesota	1458	1092	2556	283	198	483	98	61	159
Wisconsin	41	33	87	5	3	9	0	0	0
Michigan	72	67	179	4	2	10	1	0	2
Illinois	3	3	6	0	0	0	0	0	0
Iowa	19	11	30	3	0	3	0	0	0
Indiana	10	20	30	1	0	1	0	3	3
Missouri	14	7	21	0	1	1	2	2	4
Ohio	6	8	39	2	0	4	0	1	1
	1687	1309	3093	303	208	522	102	67	170

Table 22.--Mallard bandings and recoveries by reference area, 1950-1961--continued

Reference Area	Bandings			Recoveries					
				Direct			Indirect		
	Male	Female	Total1/	Male	Female	Total	Male	Female	Total
VII. Eastern Great Lakes									
S. E. Ontario	26	24	89	1	2	7	0	1	1
New York Lake Ontario Area	186	185	430	21	15	38	0	7	7
	212	209	519	22	17	45	0	8	8
VIII. Atlantic									
Central & S. New York	90	115	237	6	8	17	6	6	12
Maryland	45	47	95	0	0	0	2	1	4
Massachusetts	27	33	51		1	1	0	0	0
New Brunswick	1	0	1	0	0	2	1	0	1
New Jersey	17	24	41	0	0	0	0	0	0
Pennsylvania	7	8	29	0	0	1	3	2	5
Maine	0	1	1	0	0	0	0	0	0
Vermont	1	2	3	0	0	0	0	0	0
Connecticut	5	8	13	1	1	2	0	0	0
Nova Scotia	1	2	3	0	0	0	0	0	0
	194	240	474	7	10	23	12	9	22
Total all areas	33063	31311	67325	3635	2898	6887	1325	919	2398

1/ Totals include birds for which sex was not determined and thus frequently exceeds the sum of males and females in the table.

Table 23.--Chronology of bandings of mallard locals 1/

Year	Number banded	
1920-29		42
1930-39		137
1940-49		614
1950	646	
1951	887	
1952	895	
1953	1659	
1954	4431	
1955	4386	
1956	7558	
1957	15509	
1958	17827	
1959	5230	
1960	3899	
1961	4397	
1950-61		67324
Total		68117

1/ The term "local" was not used to identify flightless young until 1950 and was not generally used until 1954. Thus, totals given here do not include many flightless young banded before 1954 because they could not be specifically designated as such.

Table 24.--Sex ratios of trapped samples of mallard locals by reference area 1/

Reference Area	Males	Females	Percent Males
Northern Pacific			
Alaska	161	148	52.1
British Columbia	133	134	49.8
Western United States			
Washington	630	565	52.7
Oregon	139	129	51.9
California	633	513	55.2
Idaho	75	97	43.6
Nevada	37	26	58.7
Utah	104	124	45.6
Western Interior Canada			
Northwest Territory	53	55	49.1
S. W. Alberta	2305	2173	51.5
S. E. Alberta	3401	2995	53.2
S. W. Saskatchewan	10343	10004	50.8
Northern Plains			
S. E. Saskatchewan	8694	8462	50.7
S. W. Manitoba	1192	1156	50.8
W. Montana	33	29	53.2
E. Montana	243	249	49.4
North Dakota	595	575	50.8
South Dakota	1283	1250	50.6
West-central United States			
Wyoming	29	28	50.9
Colorado	516	504	50.6
Nebraska	332	309	51.8
New Mexico	32	24	57.1
Eastern Prairie and Great Lakes			
S. E. Manitoba	59	67	46.8
Minnesota	1458	1092	57.2
Wisconsin	41	33	55.4
Michigan	72	67	51.7

Table 24.--Sex ratios of trapped samples of mallard locals by reference area 1/--continued

Reference Area	Males	Females	Percent Males
Eastern Great Lakes			
New York-Lake Ontario Area	186	185	50.1
S. E. Ontario	26	24	52.0
Atlantic			
Central and Southern New York	90	115	43.9
Maryland	45	47	48.9
Massachusetts	27	33	45.0
Totals	32967	31236	51.3

1/ Includes only wild ducklings for Reference Areas with banded samples of 50 or more.

Table 25.--Distribution of direct recoveries of mallards banded as locals in each reference area of banding, 1950-61

Reference area of banding	Number recovered		Percent of U.S. recoveries occurring in each flyway				Percent occurring outside U.S. based on total recoveries		
	U. S.	Total	Atl.	Miss.	Cent.	Pac.	Alaska	Canada	Mexico
I. Northern Pacific									
Alaska	11	34	0	0	9	91	24	44	0
British Columbia	51	141	0	2	0	98	0	64	0
II. Western United States									
Washington	335	347	0	(.3)	0	100	0	3	0
Oregon	61	61	0	0	0	100	0	0	0
California	150	150	0	0	0	100	0	0	0
Idaho	26	27	0	0	8	92	0	0	4
Nevada	9	9	0	0	0	100	0	0	0
Utah	24	24	0	0	0	100	0	0	0
III. Western Interior Canada									
Northwest Territories	6	9	0	33	33	33	0	33	0
S. W. Alberta	185	428	0	10	16	74	0	57	0
S. E. Alberta	274	612	(.4)	36	35	28	0	55	0
S. W. Saskatchewan	1056	1704	1	51	39	9	0	38	0
IV. Northern Plains									
S. E. Saskatchewan	945	1666	2	68	29	1	0	43	0
W. Montana	3	3	0	0	100	0	0	0	0
E. Montana	31	34	0	26	74	0	0	9	0
S. W. Manitoba	140	332	4	72	24	0	0	58	0
North Dakota	146	150	(.7)	35	64	0	0	3	0
South Dakota	380	383	0	36	64	0	0	1	0

Table 25.--Distribution of direct recoveries of mallards banded as locals in each reference area of banding, 1950-61--continued

Reference area of banding	Number recovered		Percent of U. S. recoveries occurring in each flyway				Percent occurring outside U.S. based on total recoveries		
	U. S.	Total	Atl.	Miss.	Cent.	Pac.	Alaska	Canada	Mexico
V. West-central United States									
Wyoming	9	9	0	0	78	22	0	0	0
Colorado	85	88	0	1	95	4	0	0	3
Nebraska	80	81	0	10	90	0	0	1	0
New Mexico	5	5	0	0	100	0	0	0	0
VI. Eastern Prairie and Great Lakes									
S. E. Manitoba	3	11	0	100	0	0	0	73	0
Minnesota	475	483	(1.5)	93	5	0	0	2	0
Wisconsin	9	9	0	100	0	0	0	0	0
Michigan	8	10	0	100	0	0	0	20	0
Indiana	1	1	0	100	0	0	0	0	0
Iowa	3	3	0	100	0	0	0	0	0
Missouri	1	1	0	100	0	0	0	0	0
Ohio	4	4	0	100	0	0	0	0	0
VII. Eastern Great Lakes									
S. Ontario	3	7	67	33	0	0	0	57	0
New York, Lake Ontario Region	35	38	89	11	0	0	0	0	0
VIII. Atlantic									
New York	16	17	100	0	0	0	0	6	0
Massachusetts	1	1	100	0	0	0	0	0	0
New Brunswick	0	2	0	0	0	0	0	100	0
Pennsylvania	0	1	0	0	0	0	0	100	0
Connecticut	2	2	100	0	0	0	0	0	0

Table 26.--Distribution among States and Provinces of direct recoveries of mallards banded as locals in the reference areas of the Northern Pacific group

State or Province of recovery	Percent occurring in each State or Province from each area of banding	
	Alaska	British Columbia
Alaska and Canada		
Alaska	24	0
Alberta	3	0
British Columbia	41	64
Pacific Flyway		
California	9	2
Idaho	0	2
Oregon	0	6
Washington	21	25
Central Flyway		
Montana	3	0
Mississippi Flyway		
Louisiana	0	1
Total Percent	101	100
Number of recoveries	34	141

Table 27.--Distribution among States and Provinces of direct recoveries of mallards banded as locals in the reference areas of the Western United States group

State or Province of recovery	Percent occurring in each State or Province from each area of banding					
	Calif.	Idaho	Nevada	Oregon	Utah	Wash.
Canada						
British Columbia	0	0	0	0	0	3
Pacific Flyway						
California	89	0	0	7	0	1
Idaho	0	78	0	0	21	1
Nevada	1	0	89	0	0	0
Oregon	9	0	11	93	0	7
Utah	0	11	0	0	79	0
Washington	0	0	0	0	0	88
Central Flyway						
Wyoming	0	7	0	0	0	0
Mexico	0	4	0	0	0	0
Total Percent	99	100	100	100	100	100
Number of recoveries	150	27	9	61	24	347

Table 28.--Distribution among States and Provinces of direct recoveries of mallards banded as locals in the reference areas of the Western Interior Canada group

State or Province of recovery	Percent occurring in each State or Province from each area of banding			
	Mackenzie	SW Alberta	SE Alberta	SW Sask.
Canada				
Alberta	22.2	55.4	52.1	7.2
British Columbia	0	0.9	0.5	0
Manitoba	0	0	0.2	0.5
Saskatchewan	11.1	0.5	2.5	30.8
Pacific Flyway				
Arizona	0	0.2	0.2	0.1
California	11.1	7.7	3.1	1.5
Idaho	11.1	6.8	3.6	1.3
Nevada	0	0.7	0.8	0.2
Oregon	0	8.2	2.3	1.1
Utah	0	0.7	0.3	0.4
Washington	0	7.5	2.3	0.7
Central Flyway				
Colorado	11.1	0.7	2.6	1.2
Kansas	0	0.5	1.1	3.3
Montana	0	3.0	2.1	2.9
Nebraska	11.1	0.9	2.5	5.3
New Mexico	0	0	0.3	0.3
North Dakota	0	0	0.3	1.6
South Dakota	0	0.2	1.1	3.1
Oklahoma	0	0.5	1.6	1.3
Texas	0	0.7	3.4	4.8
Wyoming	0	0.5	2.5	0.3
Mississippi Flyway				
Alabama	0	0	0.3	0.5
Arkansas	11.1	2.6	6.5	12.0
Illinois	0	0.2	0.8	2.8
Indiana	0	0	0.3	0.4
Iowa	0	0.7	0.3	1.4
Kentucky	0	0	0.5	0.5
Louisiana	0	0.2	2.9	5.7
Michigan	0	0	0	0.1

Table 28.--Distribution among States and Provinces of direct recoveries of mallards banded as locals in the reference areas of the Western Interior Canada group--continued

State or Province of recovery	Percent occurring in each State or Province from each area of banding			
	Mackenzie	SW Alberta	SE Alberta	SW Sask.
Mississippi Flyway (con.)				
Minnesota	0	0	0.5	0.9
Mississippi	0	0.5	0.8	1.8
Missouri	11.1	0.2	1.8	4.0
Ohio	0	0	0.2	0.2
Tennessee	0	0	0.8	1.2
Wisconsin	0	0	0.2	0.1
Atlantic Flyway				
Florida	0	0	0	0.1
Georgia	0	0	0.2	0.1
North Carolina	0	0	0	0.1
South Carolina	0	0	0	0.3
Virginia	0	0	0	0.2
Mexico	0	0	0.2	0.2
Total percent	99.9	100.0	101.7	100.4
Number of recoveries	9	428	612	1,704

Table 29.--Distribution among States and Provinces of direct recoveries of mallards banded as locals in the reference areas of the Northern Plains group

State or Province of recovery	Percent occurring in each State or Province from each area of banding				
	SE Sask.	SW Manitoba	Montana	N Dak.	S Dak.
Canada					
Alberta	0.4	0	0	0	0
Manitoba	2.9	52.7	0	1.3	0.5
Ontario	0.1	0	0	0.7	0
Saskatchewan	39.9	5.1	8.1	0.7	0.3
Pacific Flyway					
Arizona	0	0	0	0	0
California	0	0	0	0	0.3
Idaho	0.4	0	0	0	0
Nevada	0	0	0	0	0
Oregon	0	0	0	0	0
Utah	0.1	0	0	0	0
Washington	0.1	0	0	0	0
Central Flyway					
Colorado	0.4	0	0	0	0
Kansas	1.8	1.5	2.7	0	2.3
Montana	0.3	0.3	18.9	0	0
Nebraska	3.0	0.9	8.1	3.3	4.2
North Dakota	3.8	3.6	13.5	50.0	7.6
Oklahoma	1.4	0	8.1	0.7	0.5
South Dakota	2.6	2.1	10.8	8.7	47.8
Texas	2.8	1.8	8.1	0	1.3
Wyoming	0.2	0	0	0	0
Mississippi Flyway					
Alabama	0.1	0.3	0	0	0
Arkansas	11.6	9.0	8.1	9.3	3.4
Illinois	3.3	3.0	0	1.3	3.7
Indiana	0.3	0.6	0	0	0.3
Iowa	2.8	3.0	0	4.0	4.2
Kentucky	0.8	0	0	0	0.3
Louisiana	7.3	3.9	5.4	3.3	2.3
Michigan	0.2	0.6	0	0	0
Minnesota	2.9	2.1	0	4.0	12.3
Mississippi	1.6	0.9	0	2.0	0.8
Missouri	4.6	3.9	8.1	6.0	6.0
Ohio	0.2	0.6	0	0	0
Tennessee	1.7	1.5	0	2.7	0.5
Wisconsin	0.7	0.9	0	1.3	1.6

Table 29.--Distribution among States and Provinces of direct recoveries of mallards banded as locals in the reference areas of the Northern Plains group--continued

State or Province of recovery	Percent occurring in each State or Province from each area of banding				
	SE Sask.	SW Manitoba	Montana	N Dak.	S Dak.
Atlantic Flyway					
Florida	0.1	0.3	0	0	0
Georgia	0.1	0.3	0	0	0
Maryland	0.6	0.3	0	0	0
New York	0.6	0	0	0	0
North Carolina	0.1	0	0	0	0
Pennsylvania	0.1	0	0	0	0
South Carolina	0.5	0.6	0	0	0
Virginia	0.1	0	0	0.7	0
Total percent	99.8	99.8	99.9	100.0	100.2
Number of recoveries	1,666	332	37	150	383

Table 30.--Distribution among States and Provinces of direct recoveries of mallards banded as locals in the reference areas of the West-central United States group

State or Province of recovery	Percent occurring in each State or Province from each area of banding				
	Colorado	Kansas	Nebraska	New Mexico	Wyoming
Canada					
Saskatchewan	0	0	1.2	0	0
Pacific Flyway					
Arizona	3.4	0	0	0	0
Idaho	0	0	0	0	11.1
Utah	0	0	0	0	11.1
Central Flyway					
Colorado	84.1	0	2.5	40.0	0
Kansas	0	0	1.2	0	0
Nebraska	1.1	0	66.7	20.0	0
New Mexico	1.1	0	0	20.0	0
North Dakota	0	0	1.2	0	0
Oklahoma	0	0	1.2	0	0
South Dakota	0	0	9.9	0	0
Texas	3.4	0	6.2	20.0	0
Wyoming	1.1	0	0	0	77.8
Mississippi Flyway					
Arkansas	1.1	0	4.9	0	0
Iowa	0	0	1.2	0	0
Louisiana	0	0	1.2	0	0
Minnesota	0	0	1.2	0	0
Missouri	0	0	1.2	0	0
Mexico	3.4	0	0	0	0
Total percent	98.7	0	103.8	100.0	100.0
Number of recoveries	88	0	81	5	9

Table 31.--Distribution among States and Provinces of direct recoveries of mallards banded as locals in the reference areas of the Eastern Prairie and Great Lakes group

State or Province of recovery	Percent occurring in each State or Province from each area of banding							
	Minn.	Wisc.	Mich.	Ill.	Ind.	La.	Mo.	Ohio
Canada								
Manitoba	1.2	0	0	0	0	0	0	0
Ontario	0.4	0	20.0	0	0	0	0	0
Central Flyway								
Kansas	0.2	0	0	0	0	0	0	25.0
Nebraska	0.2	0	0	0	0	0	0	0
North Dakota	1.7	0	0	0	0	0	0	0
Oklahoma	0.2	0	0	0	0	0	0	0
South Dakota	1.7	0	0	0	0	0	0	0
Texas	1.0	0	0	0	0	0	0	0
Mississippi Flyway								
Alabama	0.6	0	0	0	0	0	0	0
Arkansas	4.6	0	0	0	0	33.3	0	25.0
Illinois	3.7	0	0	0	0	0	100.0	0
Indiana	1.2	0	0	0	0	0	0	50.0
Iowa	3.3	0	0	0	0	33.3	0	0
Kentucky	0.4	0	0	0	0	0	0	0
Louisiana	2.3	0	0	0	0	0	0	0
Michigan	0.6	0	80.0	0	0	0	0	0
Minnesota	67.7	0	0	0	0	0	0	0
Mississippi	0.4	0	0	0	0	0	0	0
Missouri	2.5	11.1	0	0	0	0	0	0
Ohio	0.2	0	0	0	100.0	0	0	0
Tennessee	0.8	0	0	0	0	33.3	0	0
Wisconsin	3.5	88.9	0	0	0	0	0	0
Atlantic Flyway								
Florida	0.2	0	0	0	0	0	0	0
North Carolina	0.4	0	0	0	0	0	0	0
Pennsylvania	0.4	0	0	0	0	0	0	0
Virginia	0.4	0	0	0	0	0	0	0
Total Percent	99.8	100.0	100.0	0	100.0	99.9	100.0	100.0
Number of Recoveries	483	9	10	0	1	3	1	4

Table 32.--Distribution among States and Provinces of direct recoveries of mallards banded as locals in the reference areas of the Eastern Great Lakes group

State or Province of recovery	Percent occurring in each State or Province from each area of banding	
	S.E. Ontario	N.W. New York
Canada		
Ontario	57.1	7.9
Mississippi Flyway		
Kentucky	14.3	0
Michigan	0	5.3
Minnesota	0	2.6
Ohio	0	2.6
Atlantic Flyway		
Delaware	0	2.6
Maryland	0	5.3
New York	14.3	60.5
North Carolina	0	5.3
Pennsylvania	0	2.6
South Carolina	14.3	2.6
Virginia	0	2.6
Total Percent	100.0	99.9
Number of recoveries	7	38

Table 33.--Distribution among States and Provinces of direct recoveries of mallards banded as locals in the reference areas of the Atlantic group

State or Province of recovery	Percent occurring in each State or Province from each area of banding				
	S & E New York	Mass.	Pa.	Conn.	New Bruns.
Canada					
New Brunswick	0	0	0	0	100.0
Ontario	5.9	0	100.0	0	0
Atlantic Flyway					
Delaware	5.9	0	0	0	0
Maryland	11.8	0	0	0	0
Massachusetts	0	100.0	0	0	0
New Jersey	5.9	0	0	0	0
New York	52.9	0	0	0	0
North Carolina	0	0	0	50.0	0
Pennsylvania	11.8	0	0	0	0
South Carolina	5.9	0	0	0	0
Virginia	0	0	0	50.0	0
Total percent	100.1	100.0	100.0	100.0	100.0
Number of recoveries	17	1	1	2	2

Table 34.--Distribution by flyway and latitude of direct recoveries of mallards banded as locals in southwestern Alberta, 1954-1958 and 1960

Year	Percent of U. S. recoveries by flyway					Percent of total recoveries by latitude						Number of recoveries
	Atlantic	Miss.	Central	Pacific	Total	25-33°	34-38°	39-43°	44-48°	49°+	Total	
1954	0	4	7	89	100	1	8	19	17	55	100	86
1955	0	9	32	59	100	3	11	17	31	37	99	35
1956	0	20	20	60	100	0	0	23	15	62	100	13
1957	0	11	24	64	99	0	7	17	20	55	99	110
1958	0	10	6	84	100	1	7	14	9	69	100	86
1960	0	17	17	66	100	3	3	14	11	70	101	37
Average percent	0	11.8	17.7	70.3		1.3	6.0	17.3	17.2	58.0		

Table 35.--Distribution by flyway and latitude of direct recoveries of mallards banded as locals in southeastern Alberta, 1954-60

Year	Percent of U. S. recoveries by flyway					Percent of total recoveries by latitude						Number of recoveries
	Atlantic	Miss.	Central	Pacific	Total	25-33°	34-38°	39-43°	44-48°	49°+	Total	
1954	0	38	25	38	101	16	5	16	5	58	100	19
1955	0	50	39	11	100	11	21	25	7	36	100	28
1956	0	31	31	37	99	7	15	15	11	52	100	73
1957	0	34	37	28	100	9	12	12	11	57	101	156
1958	0	36	36	28	100	9	18	19	5	50	101	214
1959	0	31	34	34	99	6	7	10	6	71	100	69
1960[1/]						5	9	5	0	82	101	22
Average percent	0	37.2	33.7	31.0		9.0	12.4	14.6	6.4	58.0		

1/ Recoveries within the United States were too few (4) to calculate percentages for 1960.

Table 36.--Distribution by flyway and latitude of direct recoveries of mallards banded as locals in southwestern Saskatchewan, 1954-1960

Year	Percent of U. S. recoveries by flyway					Percent of total recoveries by latitude						Number of recoveries
	Atlantic	Miss.	Central	Pacific	Total	25-33°	34-38°	39-43°	44-48°	49°+	Total	
1954	3	42	42	12	99	28	12	17	6	36	99	140
1955	0	59	30	11	100	14	16	24	7	38	99	122
1956	1	56	34	9	100	15	22	24	6	33	100	318
1957	1	49	43	7	100	7	25	19	10	40	101	473
1958	1	52	40	7	100	15	21	17	9	38	100	503
1959	3	47	43	7	100	9	15	18	3	55	100	67
1960	0	75	25	0	100	6	19	25	0	50	100	16
Average percent	1.1	50.5	39.6	8.6		14.0	17.6	19.6	6.8	41.8		

Table 37.--Distribution by flyway and latitude of direct recoveries of mallards banded as locals in southeastern Saskatchewan, 1954-61

Year	Percent of U. S. recoveries by flyway					Percent of total recoveries by latitude						Number of recoveries
	Atlantic	Miss.	Central	Pacific	Total	25-33°	34-38°	39-43°	44-48°	49°+	Total	
1954	13	67	20	0	100	17	19	19	5	40	100	75
1955	0	80	20	0	100	16	19	13	8	44	100	62
1956	0	70	28	1	99	26	15	18	5	36	100	104
1957	1	53	45	1	100	9	21	13	14	43	100	317
1958	2	74	23	1	100	17	22	10	7	45	101	590
1959	1	73	24	2	100	10	20	20	8	42	100	146
1960	1	72	24	2	99	15	22	14	6	42	99	156
1961	1	72	27	0	100	5	13	20	16	46	100	165
Average percent	2.4	70.1	27.6	0.9		14.4	18.9	15.9	8.6	42.2		

Table 38.--Distribution by flyway and latitude of direct recoveries of mallards banded as locals in southwestern Manitoba, 1954, 1956-1959, and 1961

Year	Percent of U. S. recoveries by flyway					Percent of total recoveries by latitude						Number of recoveries
	Atlantic	Miss.	Central	Pacific	Total	25-33°	34-38°	39-43°	44-48°	49°+	Total	
1954	0	67	33	0	100	23	38	8	0	31	100	13
1956	11	78	11	0	100	16	16	11	5	53	101	19
1957	3	77	20	0	100	4	25	25	4	41	99	51
1958	4	71	24	0	99	9	10	9	8	65	101	128
1959	0	87	13	0	100	0	9	18	9	64	100	22
1961	0	67	33	0	100	0	0	18	36	45	99	11
Average percent	3.0	74.5	22.3	0		8.7	16.3	14.8	10.3	49.8		

Table 39.--Distribution by flyway and latitude of direct recoveries of mallards banded as locals in North Dakota, 1955-1958 and 1961

Year	Percent of U. S. recoveries by flyway					Percent of total recoveries by latitude						Number of recoveries
	Atlantic	Miss.	Central	Pacific	Total	25-33°	34-38°	39-43°	44-48°	49°+	Total	
1955	0	35	65	0	100	13	9	13	65	0	100	23
1956	4	18	79	0	101	3	10	17	66	3	99	29
1957	0	27	73	0	100	4	13	13	69	0	99	45
1958	0	50	50	0	100	9	23	9	59	0	100	22
1961	0	56	44	0	100	0	18	29	47	6	100	17
Average percent	0.8	37.2	62.2	0		5.8	14.6	16.2	61.2	1.8		

Table 40.--Distribution by flyway and latitude of direct recoveries of mallards banded as locals in South Dakota, 1954-1957

Year	Percent of U. S. recoveries by flyway					Percent of total recoveries by latitude						Number of recoveries
	Atlantic	Miss.	Central	Pacific	Total	25-33°	34-38°	39-43°	44-48°	49°+	Total	
1954	0	29	68	3	100	8	8	18	66	0	100	38
1955	0	38	62	0	100	5	12	28	54	1	100	129
1956	0	35	65	0	100	3	6	20	69	1	99	155
1957	0	33	67	0	100	0	9	30	60	0	99	33
Average percent	0	33.8	65.5	0.8		4.0	8.8	24.0	62.2	0.5		

Table 41.--Comparison of the distribution of direct and indirect recoveries of mallards banded as locals in southwestern Saskatchewan

Area of recovery	Percent of Direct recoveries			Percent of Indirect recoveries		
	Males	Females	Total	Males	Females	Total
Canada	38.4	37.2	38.0	17.4	23.1	19.6
Southwestern Saskatchewan	26.8	31.1	28.8	4.9	9.2	6.6
Pacific Flyway[1/]	8.4	8.7	8.5	10.7	13.0	11.6
Central Flyway	40.2	38.0	39.0	43.1	40.2	42.0
Mississippi Flyway	50.8	51.6	51.4	45.3	46.5	45.7
Atlantic Flyway	0.5	1.7	1.0	0.9	0.3	0.7
Total percent	99.9	100.0	99.9	100.0	100.0	100.0
25°-30° latitude	3.8	4.5	4.1	3.8	2.7	3.4
30°-35° latitude	17.4	18.1	17.8	16.0	16.1	16.0
35°-40° latitude	16.8	18.4	17.5	24.7	20.9	23.2
40°-45° latitude	16.2	14.9	15.6	24.8	29.0	26.4
45°-50° latitude	9.4	8.5	9.0	15.7	10.5	13.7
North of 50° latitude	36.4	35.6	35.9	14.9	21.7	17.5
Total percent	100.0	100.0	99.9	99.9	100.9	100.2

1/ Only recoveries from the United States are considered in calculating proportions of recoveries by flyways.

Table 42.--Comparison of the distribution of direct and indirect recoveries of mallards banded as locals in southeastern Saskatchewan

Area of recovery	Percent of Direct recoveries			Percent of Indirect recoveries		
	Males	Females	Total	Males	Females	Total
Canada	42.8	43.6	43.1	18.8	26.0	21.7
Southeastern Saskatchewan	36.4	40.0	37.9	8.5	17.5	10.8
Pacific Flyway[1/]	0.8	1.2	1.0	2.1	1.9	2.0
Central Flyway	28.5	26.0	27.4	32.5	26.5	30.3
Mississippi Flyway	69.2	70.2	69.6	63.3	71.1	66.6
Atlantic Flyway	1.5	2.6	2.0	1.5	0.5	1.1
Total percent	100.0	100.0	100.0	99.4	100.0	100.0

1/ Only recoveries from the United States are considered in calculating proportions of recoveries by flyways.

Table 43.--Comparison of the distribution of direct and indirect recoveries of mallards banded as locals in southeastern Alberta

Area of recovery	Percent of Direct recoveries			Percent of Indirect recoveries		
	Males	Females	Total	Males	Females	Total
Canada	54.8	56.1	55.2	25.5	35.2	29.2
Southeastern Alberta	48.0	51.0	49.0	13.3	30.5	19.8
Pacific Flyway[1/]	24.2	33.6	28.2	35.7	35.3	35.1
Central Flyway	39.8	30.0	35.5	37.1	32.3	36.0
Mississippi Flyway	35.4	36.4	35.9	27.1	32.3	28.9
Atlantic Flyway	0.6	0	0.4	0	0	0
Total percent	100.0	100.0	100.0	99.9	99.9	100.0

1/ Only recoveries from the United States are considered in calculating proportions of recoveries by flyways.

Table 44.--Annual distribution among States and Provinces of direct recoveries of male mallards banded as locals in Saskatchewan, 1954-1959

State of recovery	Percent of recoveries							
	Each year						All years	
	54	55	56	57	58	59	Total	S. of Canada
Alaska and Canada								
Alaska	0	0	0	0	0	0	0	
Alberta	.9	3.2	3.0	9.0	5.3	3.3	4.1	
British Columbia	0	0	0	0	0	0	0	
Mackenzie	0	0	0	0	0	0	0	
Manitoba	.9	0	.4	1.8	.8	.8	.8	
Ontario	0	0	0	0	0	0	0	
Saskatchewan	36.5	39.8	30.2	29.9	36.4	40.5	35.6	
Total	38.3	43.0	33.6	40.7	42.5	44.6	40.5	
Pacific Flyway								
Arizona	0	0	0	0	.2	0	Trace	
California	.9	1.1	1.3	.5	.8	0	.8	
Idaho	.9	2.1	0	.7	.7	.8	.9	
Nevada	0	0	.4	0	0	0	.1	
Oregon	.9	2.1	1.3	.7	.2	0	.9	
Utah	0	0	0	.2	.3	.8	.2	
Washington	0	0	.4	.9	.7	0	.3	
Total	2.7	5.3	3.4	3.0	2.9	1.6	3.2	5.4
Central Flyway								
Colorado	.9	0	1.7	.7	1.0	.8	.8	
Kansas	.9	0	3.4	3.5	2.3	2.5	2.1	
Montana	.9	1.1	.4	3.5	2.0	.8	1.4	
Nebraska	1.8	4.3	6.8	4.6	3.5	8.3	4.9	
New Mexico	.9	1.1	0	0	0	0	.3	
North Dakota	.9	1.1	1.7	5.6	2.2	2.5	2.3	
Oklahoma	0	2.1	2.1	1.6	1.0	.8	1.3	
South Dakota	1.8	0	2.6	5.1	2.0	3.3	2.5	
Texas	12.2	3.2	4.2	2.8	3.8	.8	4.5	
Wyoming	0	0	.4	0	0	0	.1	
Total	20.3	12.9	23.3	27.4	17.8	19.8	20.2	36.5

Table 44.--Annual distribution among States and Provinces of direct recoveries of male mallards banded as locals in Saskatchewan, 1954-1959--continued

State of recovery	Percent of recoveries							
	Each year						All year	
	54	55	56	57	58	59	Total	S. of Canada
Mississippi Flyway								
Alabama	.9	0	.8	.5	.5	1.6	.7	
Arkansas	7.8	9.7	11.9	12.1	13.7	11.6	11.3	
Illinois	5.2	3.2	3.8	1.4	2.7	6.6	3.8	
Indiana	0	1.1	0	.5	.7	0	.4	
Iowa	1.8	5.4	2.6	1.4	1.5	1.6	2.4	
Kentucky	.9	0	0	.2	1.2	1.6	.6	
Louisiana	9.6	6.4	8.1	2.6	5.2	2.5	5.7	
Michigan	0	0	0	0	.5	0	.1	
Minnesota	.9	3.2	2.6	.7	3.0	1.6	2.0	
Mississippi	.9	0	.8	.9	2.5	3.3	1.4	
Missouri	7.0	7.5	7.2	4.6	3.5	3.3	5.5	
Ohio	0	0	.4	0	0	0	.1	
Tennessee	0	2.1	.4	3.5	.8	0	1.1	
Wisconsin	0	0	.4	.5	.7	0	.3	
Total	35.0	38.6	39.0	28.9	36.5	33.7	35.4	59.3
Atlantic Flyway								
Florida	.9	0	0	0	0	0	.1	
Georgia	.9	0	0	0	0	0	.1	
Maryland	0	0	0	0	0	0	0	
New York	0	0	0	0	0	0	0	
North Carolina	.9	0	.4	0	.2	0	.2	
Pennsylvania	0	0	0	0	0	0	0	
South Carolina	.9	0	0	0	.2	0	.1	
Virginia	.9	0	0	0	0	0	.1	
Total	4.5	0	.4	0	.4	0	.6	1.3
Mexico	0	0	0	0	0	0	0	
Total percent	100.8	99.8	99.7	100.0	100.1	99.7	99.9	
Number of recoveries	115	93	235	431	599	121	1594	946

Table 45.--Annual distribution among States and Provinces of direct recoveries of female mallards banded as locals in Saskatchewan, 1954-1959

State of recovery	Percent of recoveries							
	Each year						All years	
	54	55	56	57	58	59	Total	S. of Canada
Alaska and Canada								
Alaska	0	0	0	0	0	0	0	
Alberta	2.0	1.1	1.1	5.3	2.0	3.3	2.5	
British Columbia	0	0	0	0	0	0	0	
Mackenzie	0	0	0	0	0	0	0	
Manitoba	0	1.1	.5	1.7	1.6	0	.8	
Ontario	0	0	0	0	0	0	0	
Saskatchewan	34.3	33.7	31.7	34.3	36.8	46.2	36.2	
Total	36.3	35.9	33.3	41.3	40.4	49.5	39.5	
Pacific Flyway								
Arizona	0	0	.5	0	0	0	.1	
California	3.0	1.0	2.2	1.1	0	0	1.2	
Idaho	1.0	1.1	2.7	.6	.6	1.1	1.2	
Nevada	1.0	0	0	0	0	0	.2	
Oregon	3.0	1.1	1.1	.6	.2	0	1.0	
Utah	0	0	0	0	.4	1.1	.2	
Washington	0	0	.5	.3	.2	0	.2	
Total	8.0	3.2	7.0	2.6	1.4	2.2	4.1	6.9
Central Flyway								
Colorado	1.0	0	.5	.3	.8	0	.4	
Kansas	3.0	3.4	1.1	3.9	2.0	0	2.2	
Montana	0	3.4	1.1	2.8	.8	1.1	1.5	
Nebraska	4.0	4.5	4.8	4.4	4.0	1.1	2.3	
New Mexico	0	0	1.1	.3	.2	0	.3	
North Dakota	3.0	4.5	2.2	3.6	1.2	4.4	3.2	
Oklahoma	0	0	2.7	1.1	1.8	0	0	
South Dakota	4.0	0	1.6	4.4	2.8	1.1	2.3	
Texas	8.1	3.4	4.3	1.9	5.1	1.1	4.0	
Wyoming	2.0	1.1	0	.8	0	1.1	.8	
Total	25.1	20.3	19.4	23.5	18.7	9.9	17.0	32.2

Table 45.--Annual distribution among States and Provinces of direct recoveries of female mallards banded as locals in Saskatchewan, 1954-1959--continued

State of recovery	Percent of recoveries							
	Each year						All years	
	54	55	56	57	58	59	Total	S. of Canada
Mississippi Flyway								
Alabama	1.0	0	.3	.8	1.1	0	.5	
Arkansas	4.0	9.0	11.3	15.6	12.1	14.3	11.0	
Illinois	3.0	2.2	2.7	1.7	3.4	3.3	2.7	
Indiana	0	1.1	.5	0	.2	1.1	.5	
Iowa	1.0	3.4	2.2	.6	1.4	3.3	2.0	
Kentucky	0	1.1	.5	.8	.6	1.1	.7	
Louisiana	9.1	13.5	12.4	4.2	8.5	7.7	9.2	
Michigan	0	1.1	0	.3	.2	0	.3	
Minnesota	0	1.1	1.1	.6	1.2	0	.7	
Mississippi	1.0	0	2.2	2.8	2.4	0	1.4	
Missouri	4.0	7.9	3.8	3.3	4.0	3.3	4.4	
Ohio	0	0	1.1	0	.4	0	.2	
Tennessee	3.0	0	1.6	.8	1.4	1.1	1.3	
Wisconsin	1.0	0	0	.3	.4	0	.3	
Total	27.1	40.4	39.7	31.8	37.3	35.2	35.2	58.3
Atlantic Flyway								
Florida	0	0	.5	0	.2	0	.1	
Georgia	1.0	0	0	0	0	0	.2	
Maryland	0	0	0	0	0	1.1	.2	
New York	0	0	0	0	0	0	0	
North Carolina	0	0	0	0	0	0	0	
Pennsylvania	0	0	0	0	0	0	0	
South Carolina	1.0	0	0	.6	1.2	1.1	.6	
Virginia	1.0	0	0	.3	.4	0	.3	
Total	3.0	0	.5	.9	1.8	2.2	1.4	2.3
Mexico	0	0	.5	.3	.2	0	.2	.3
Total percent	99.5	99.8	100.4	100.4	99.9	99.0	99.9	
Number of recoveries	99	89	186	359	494	91	1318	695

Table 46.--Direct recovery rates of mallards banded as locals[1/]

Reference area of banding	Recovery rates		
	Male	Female	Total
Northern Pacific			
Alaska	9.3	11.5	10.2
British Columbia	18.8	19.4	17.7
Western United States			
Washington	13.2	10.1	12.0
Oregon	20.8	20.9	17.6
California	14.7	11.1	13.1
Idaho	(13.3)	(10.3)	14.1
Nevada	(13.5)	(11.5)	5.7
Utah	9.6	11.3	10.5
Western Interior Canada			
Mackenzie Territory	(5.6)	(10.9)	8.2
S. W. Alberta	10.8	8.2	9.5
S. E. Alberta	10.5	8.4	9.5
S. W. Saskatchewan	8.9	7.8	8.4
Northern Plains			
S. E. Saskatchewan	10.6	8.8	9.7
S. W. Manitoba	14.0	14.1	14.1
W. Montana	(0)	(10.3)	(4.8)
E. Montana	8.6	4.8	6.8
North Dakota	16.0	9.6	12.8
South Dakota	15.7	14.4	15.1
West-central United States			
Wyoming	(17.2)	(14.3)	(15.8)
Colorado	7.8	8.7	8.1
Nebraska	14.2	11.0	12.5
Eastern Prairie and Great Lakes			
S. E. Manitoba	(8.5)	(6.0)	7.9
Minnesota	19.4	18.1	18.9
Wisconsin	(12.2)	(9.1)	(10.3)
Michigan	(5.6)	(3.0)	5.6
Eastern Great Lakes			
S. E. Ontario	(3.8)	(8.3)	(7.9)
N. W. New York	11.3	8.1	8.8

Table 46.--Direct recovery rates of mallards banded as locals[1/]--continued

Reference area of banding	Recovery rate		
	Male	Female	Total
Atlantic			
Central and Southern New York	(6.7)	7.0	7.2
Other areas	1.0	1.6	2.5
Total all reference areas	11.0	9.2	10.2

1/ Includes recoveries from normal and dog-caught birds. Inclusion of birds caught by dogs results in rates that are depressed by about 4.2 percent in Alberta, 8.8 percent in Saskatchewan, and 21.2 percent in Manitoba. Recovery rates based on less than 100 bandings are enclosed in parentheses.

Table 47.--Annual direct recovery rates of mallards banded as locals in the Prairie Provinces and North Central States, 1954-1961[1/]

Area of banding	Percent of bands recovered by year of banding							
	54	55	56	57	58	59	60	61
Southwestern Alberta	10.9	12.5	9.6	10.2	9.9	5.9	6.9	6.8
Southeastern Alberta	9.1	10.9	13.2	9.1	9.4	6.5	5.9	3.6
Southwestern Saskatchewan	9.9	11.4	10.7	7.6	8.0	4.7	4.9	0
Southeastern Saskatchewan	12.2	10.7	12.6	10.6	10.0	8.4	9.2	6.7
Southwestern Manitoba	10.2	(9.5)	11.8	10.4	12.2	12.0	(17.9)	9.3
North Dakota	(20.6)	14.6	12.6	15.0	20.1	(11.1)	0	6.7
South Dakota	18.4	13.9	17.5	9.8	0	0	0	0
Minnesota	21.1	18.4	18.5	16.3	20.5	15.9	(26.5)	(12.1)

1/ Recovery rates are enclosed in parentheses when based on less than 100 bandings.

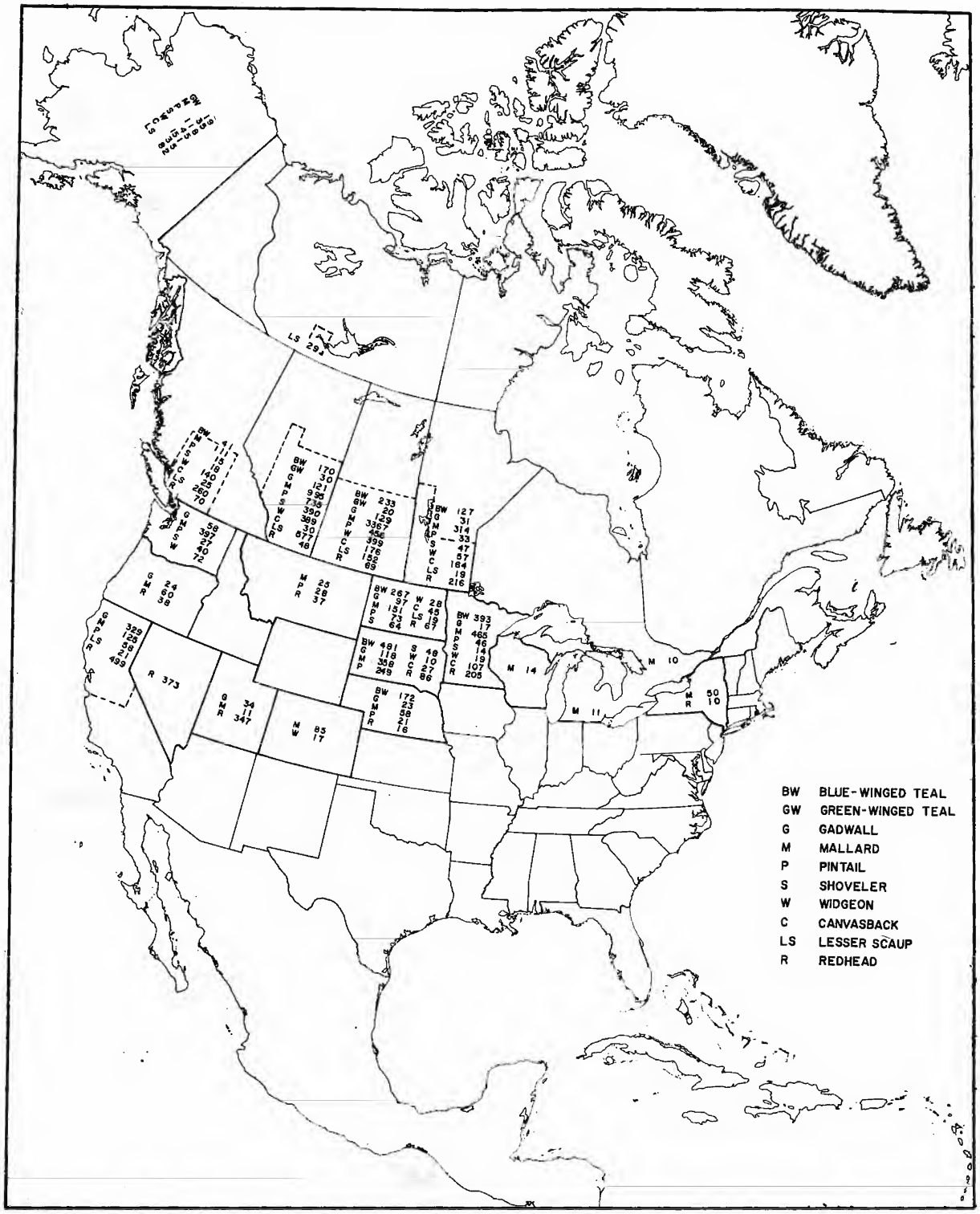

Figure 1.--Geographical distribution of banding as indicated by number of recoveries from States and Provinces of banding.

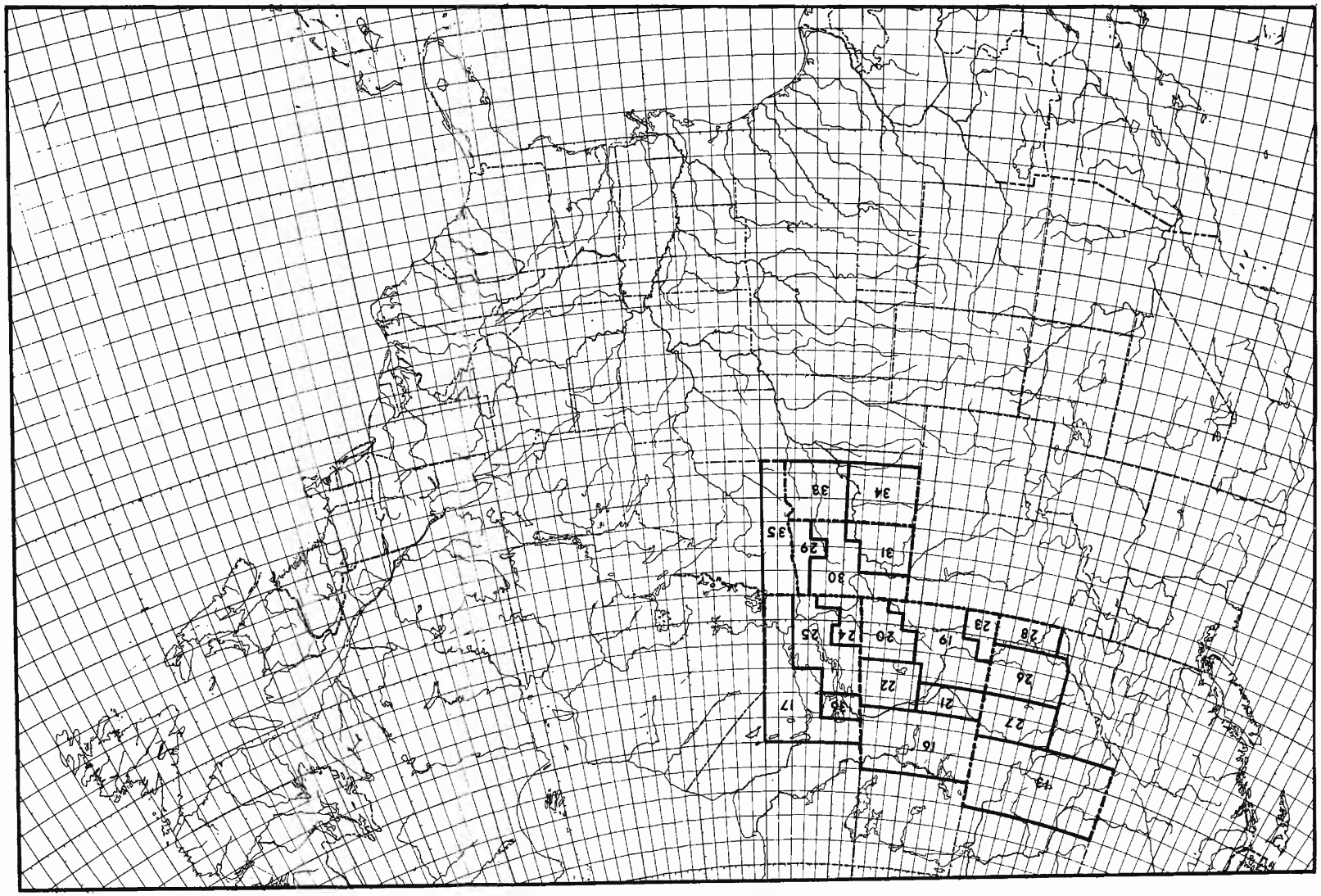

Figure 2.--Location of census strata used in breeding population surveys.

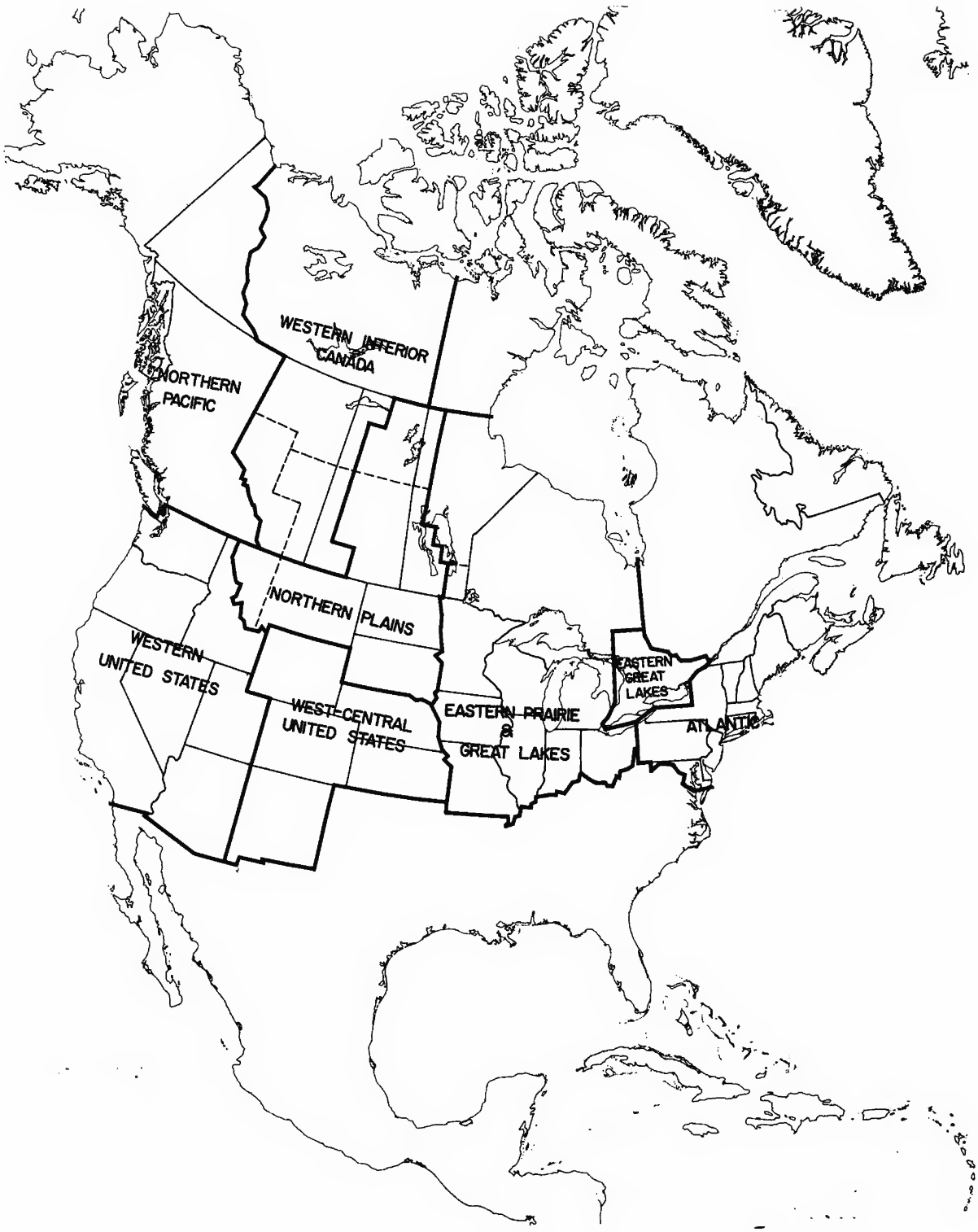

Figure 3.--Areas of banding for local mallards grouped into eight regions according to recovery distribution patterns.

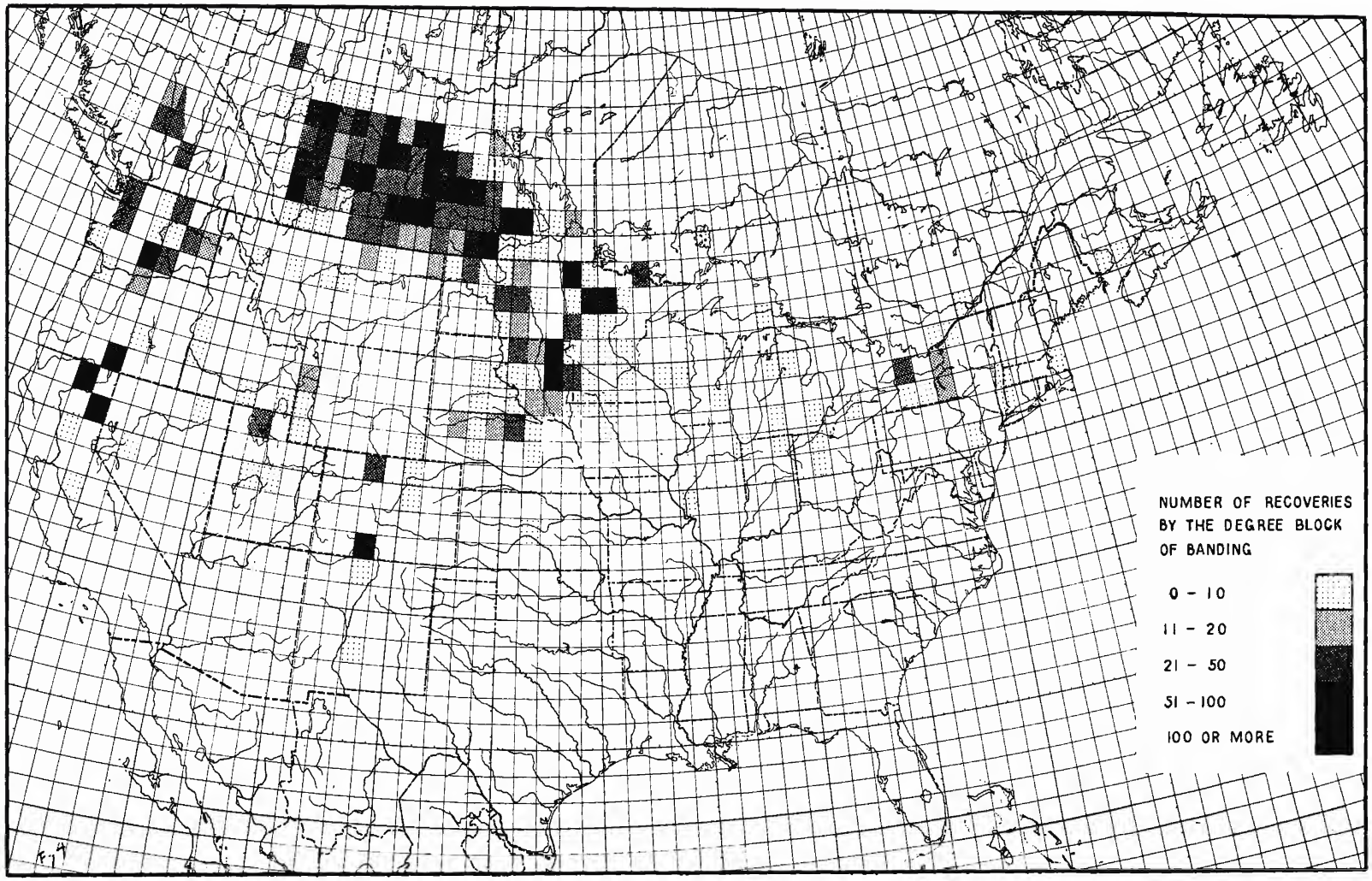

Figure 4.--Geographical distribution of mallard bandings as indicated by number of recoveries resulting from bandings in each degree block.

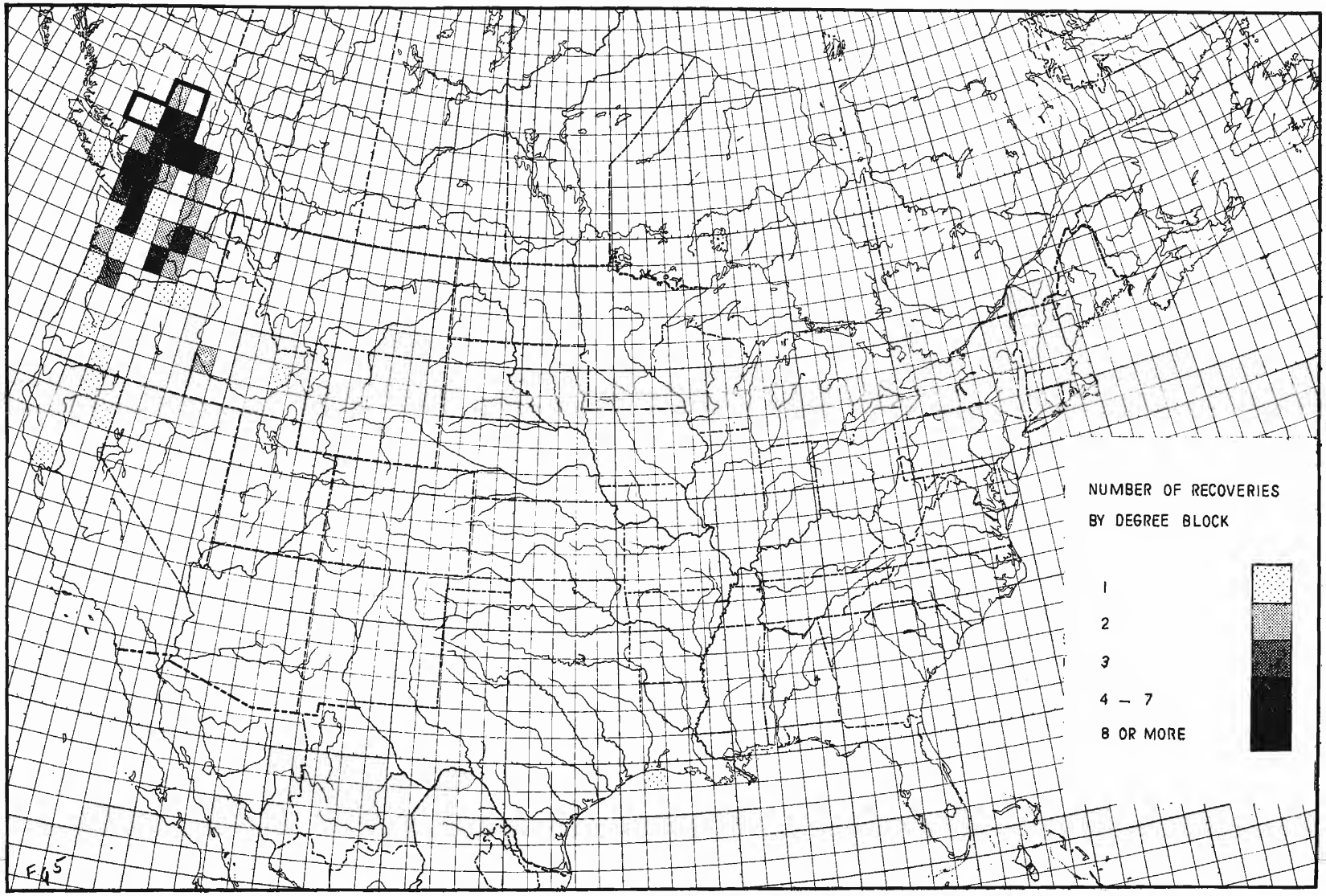

Figure 5.--Direct recoveries of local mallards from bandings in British Columbia.

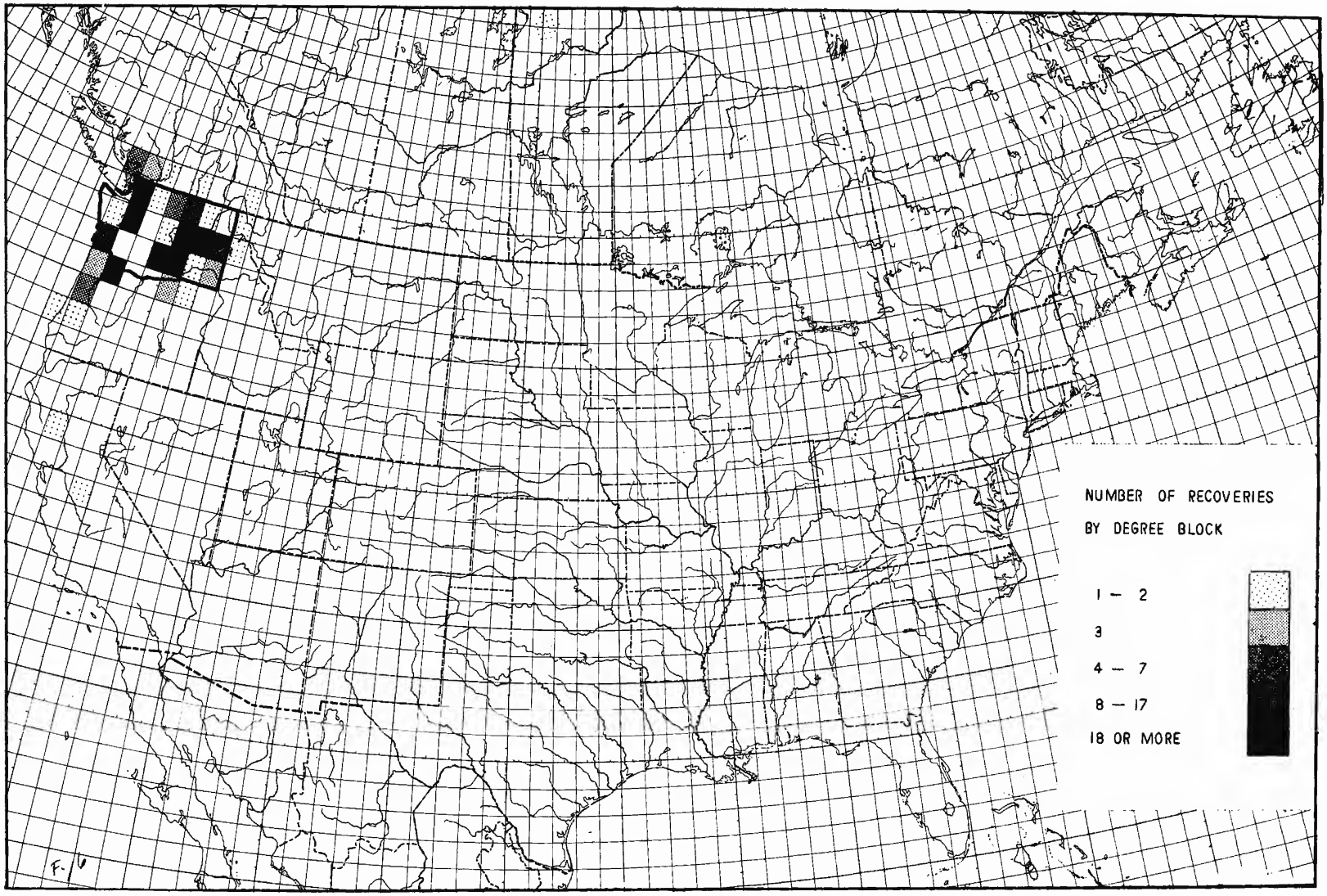

Figure 6.--Direct recoveries of local mallards from bandings in Washington.

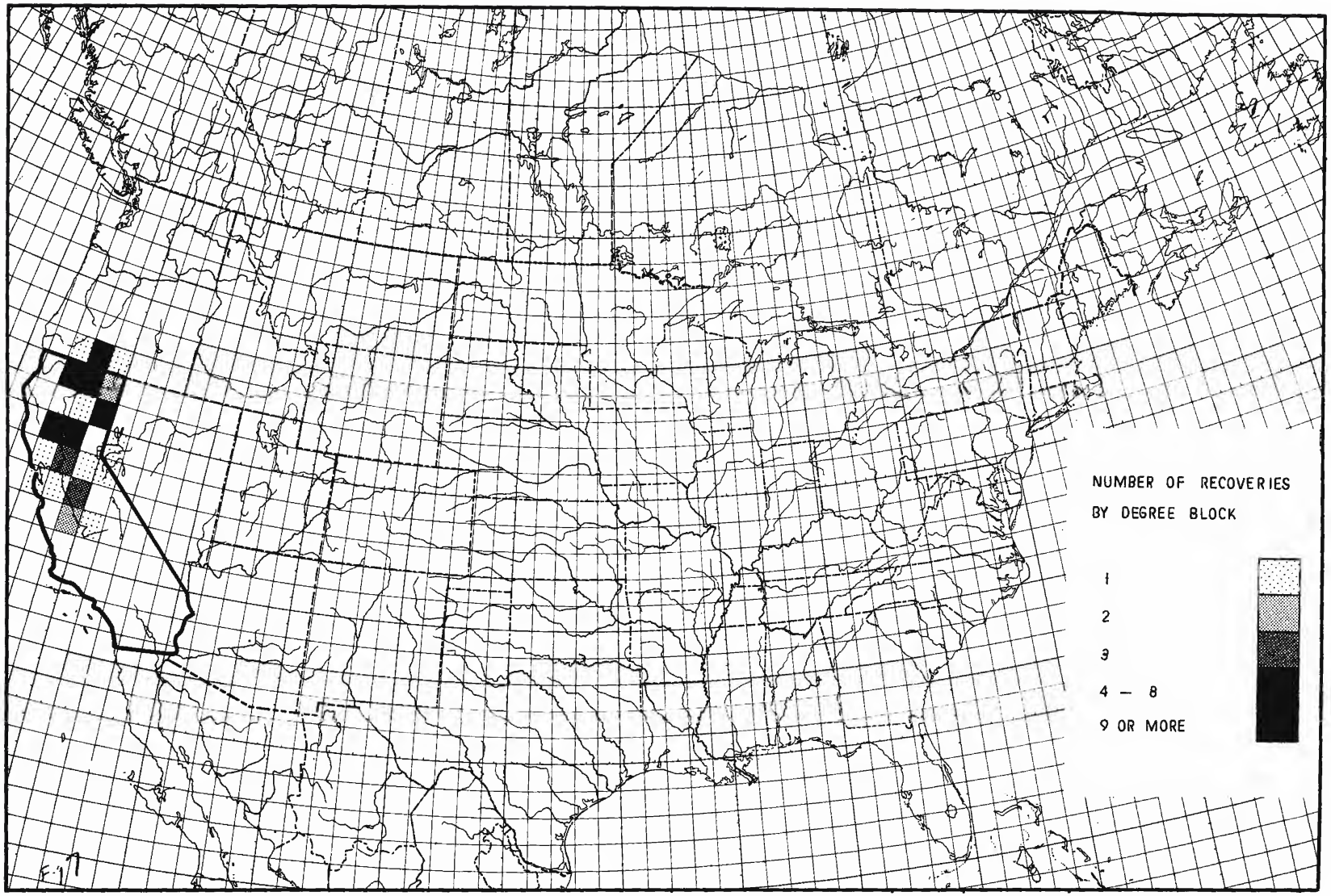

Figure 7.--Direct recoveries of local mallards from bandings in California.

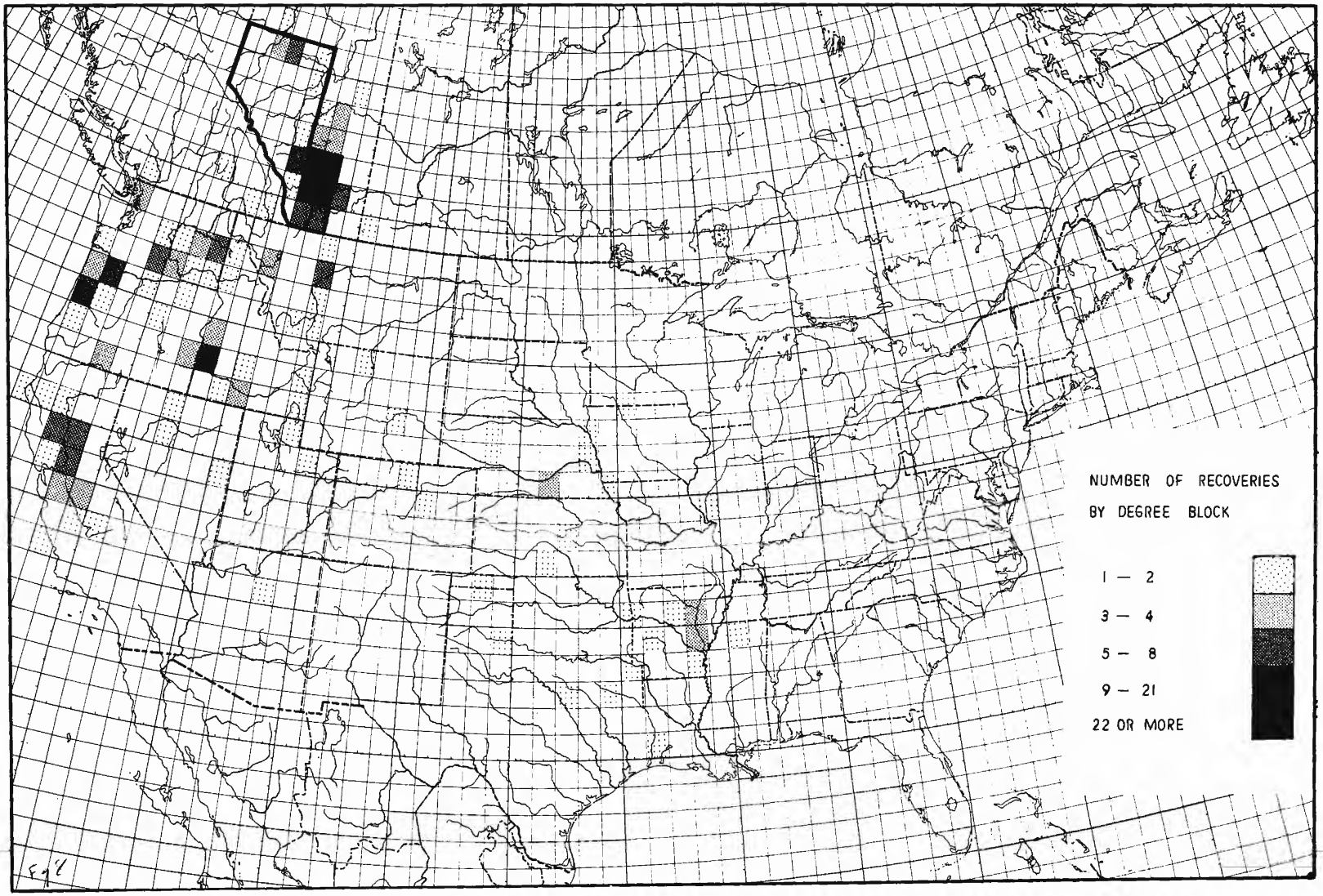

Figure 8.--Direct recoveries of local mallards from bandings in southwestern Alberta.

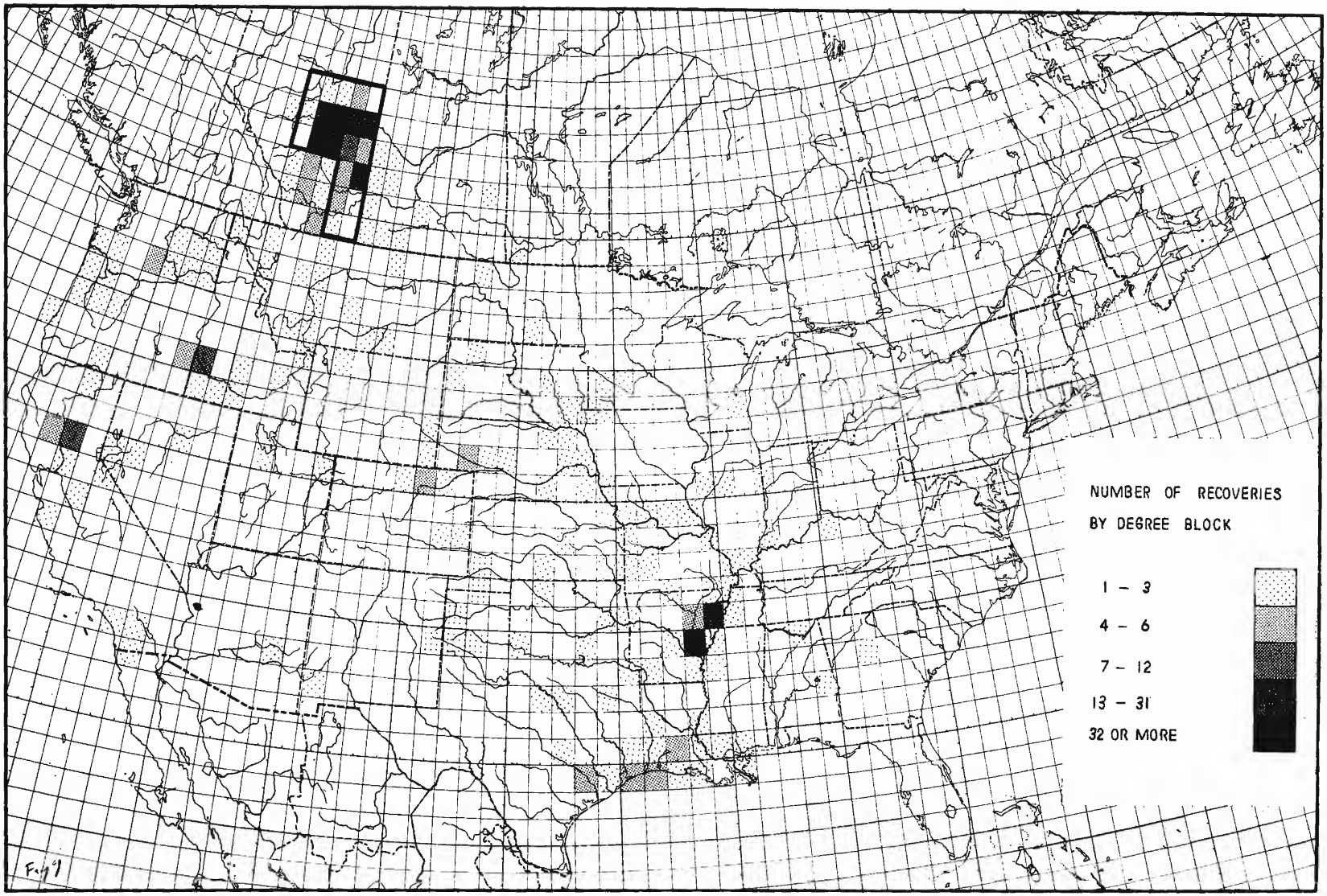

Figure 9.--Direct recoveries of local mallards from bandings in southeastern Alberta.

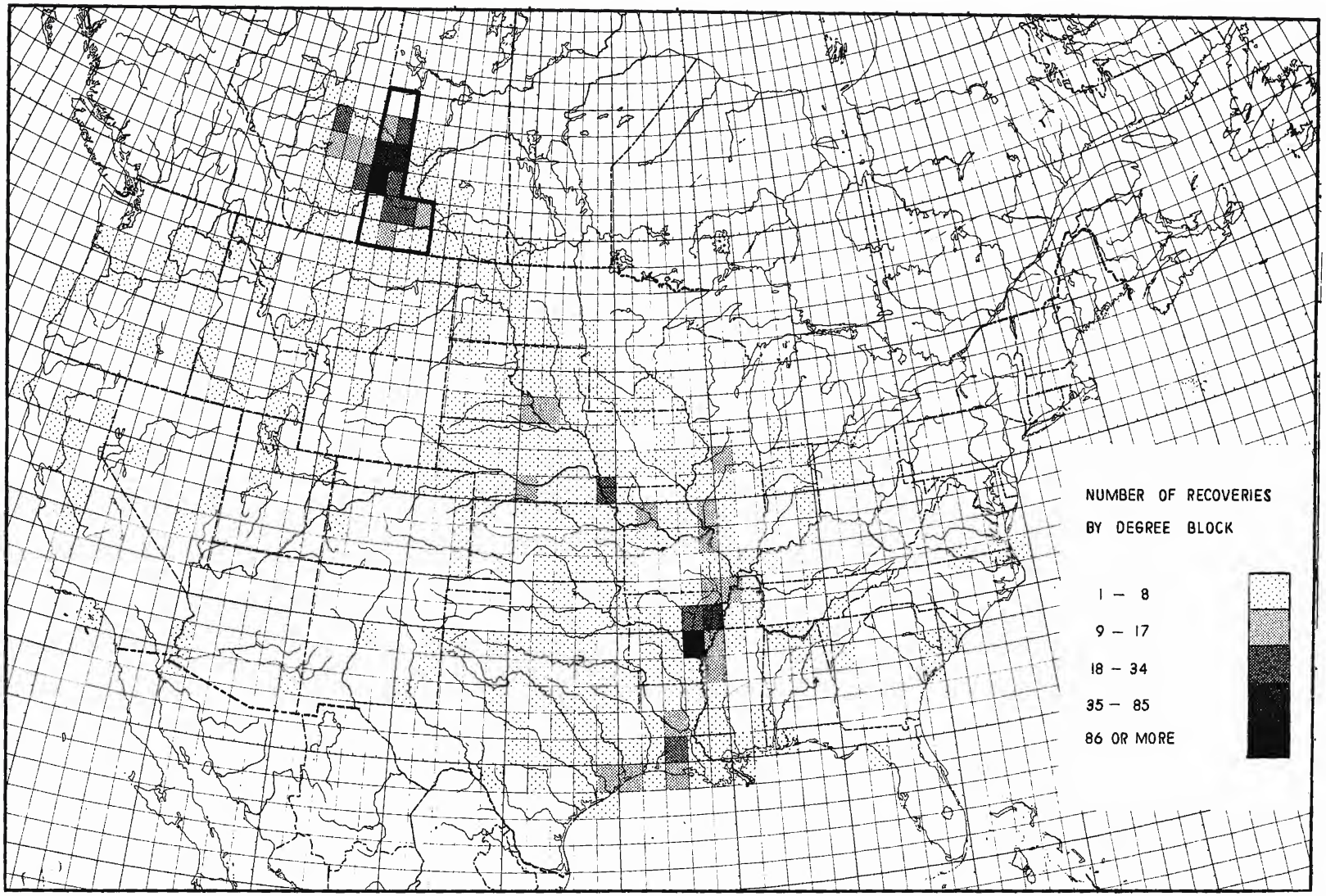

Figure 10.--Direct recoveries of local mallards from bandings in southwestern Saskatchewan.

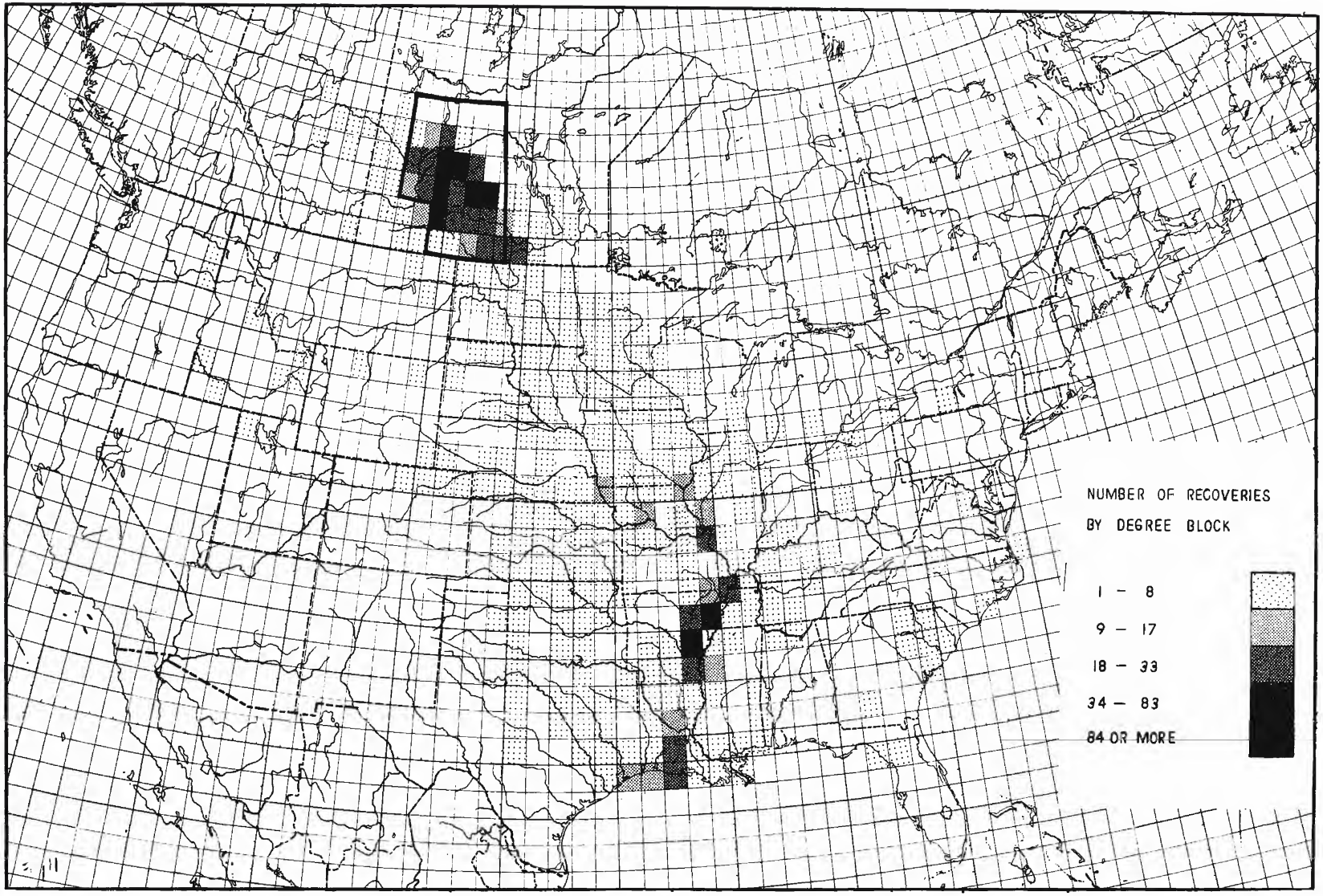

Figure 11.--Direct recoveries of local mallards from bandings in southeastern Saskatchewan.

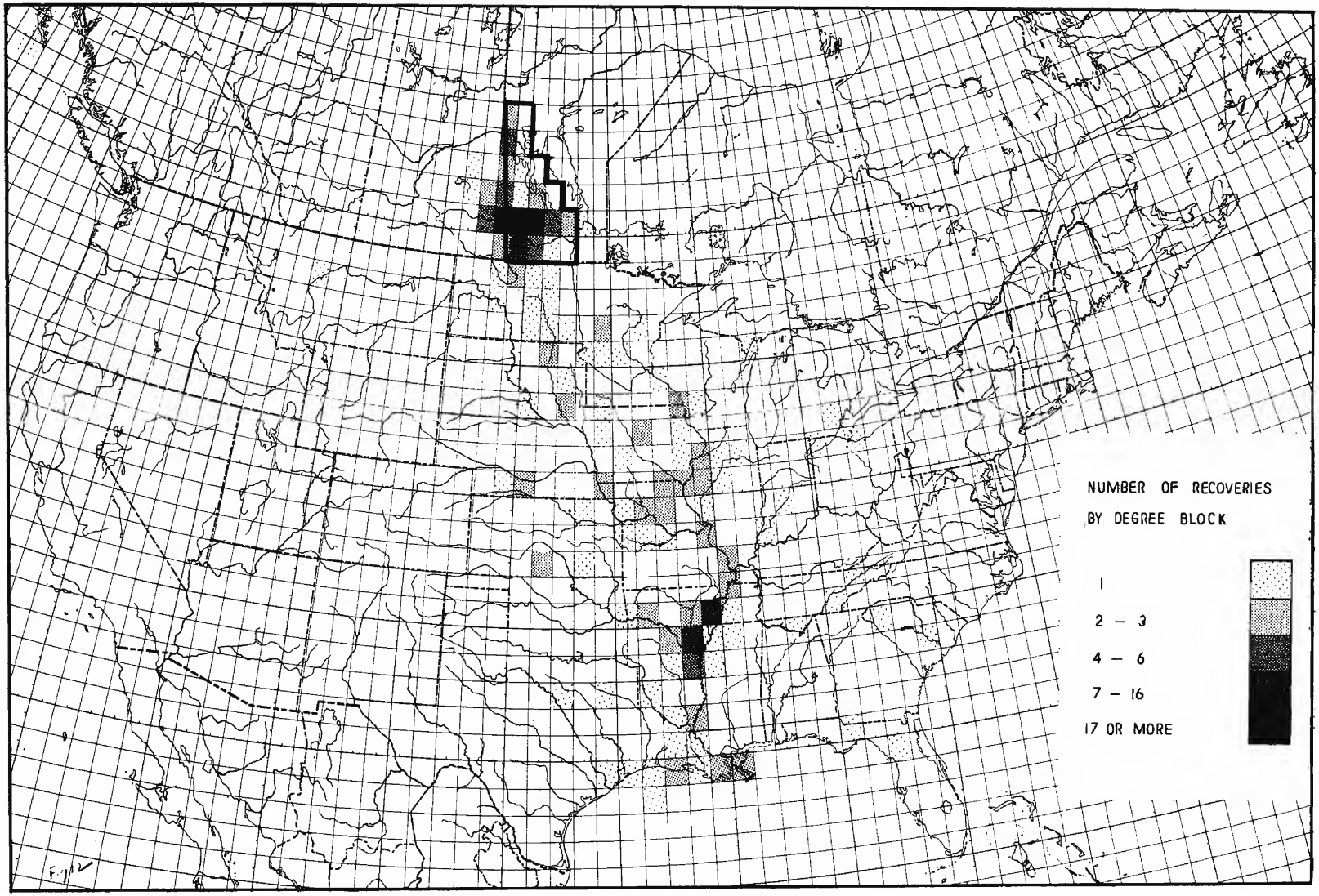

Figure 12.--Direct recoveries of local mallards from bandings in southwestern Manitoba.

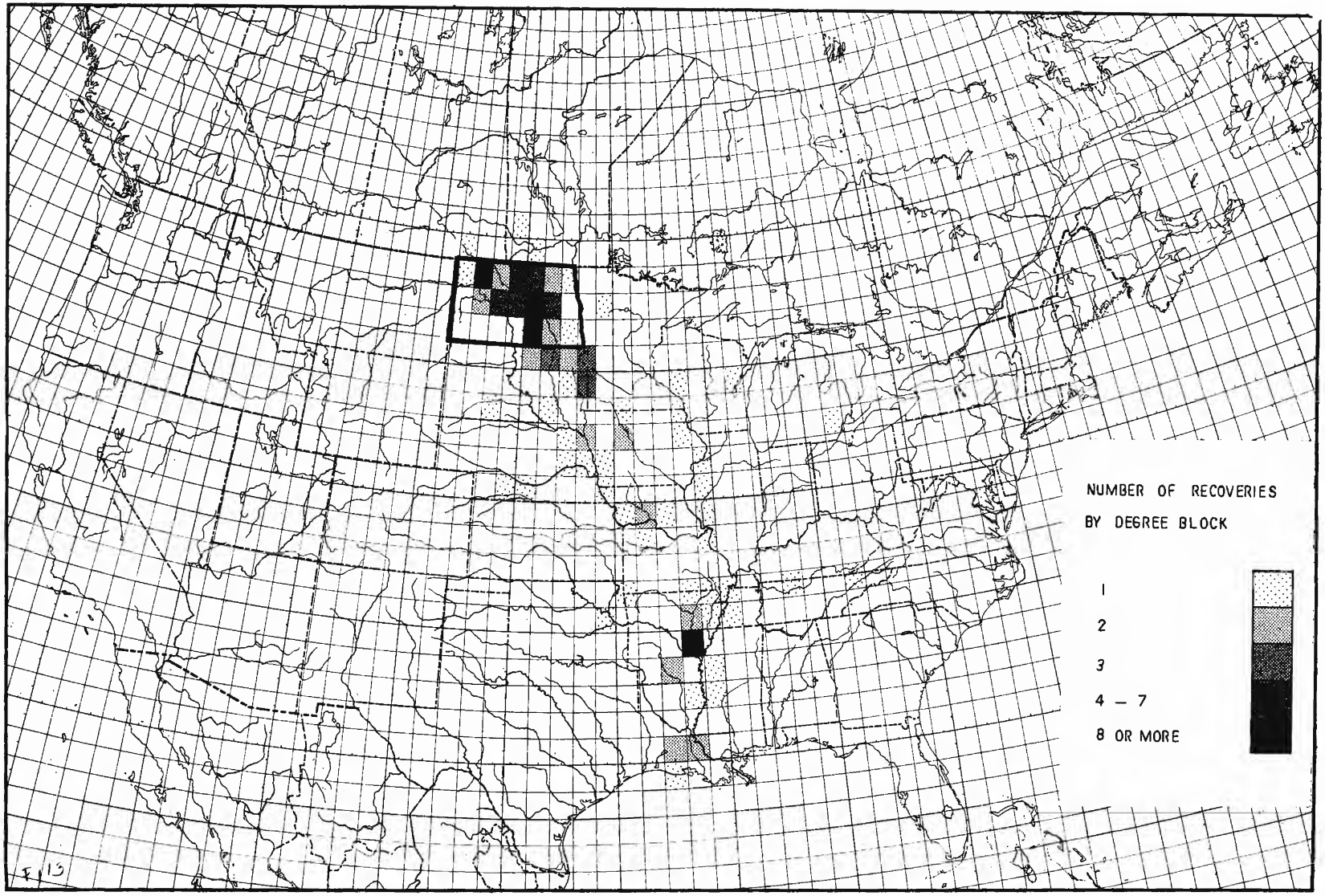

Figure 13.--Direct recoveries of local mallards from bandings in North Dakota.

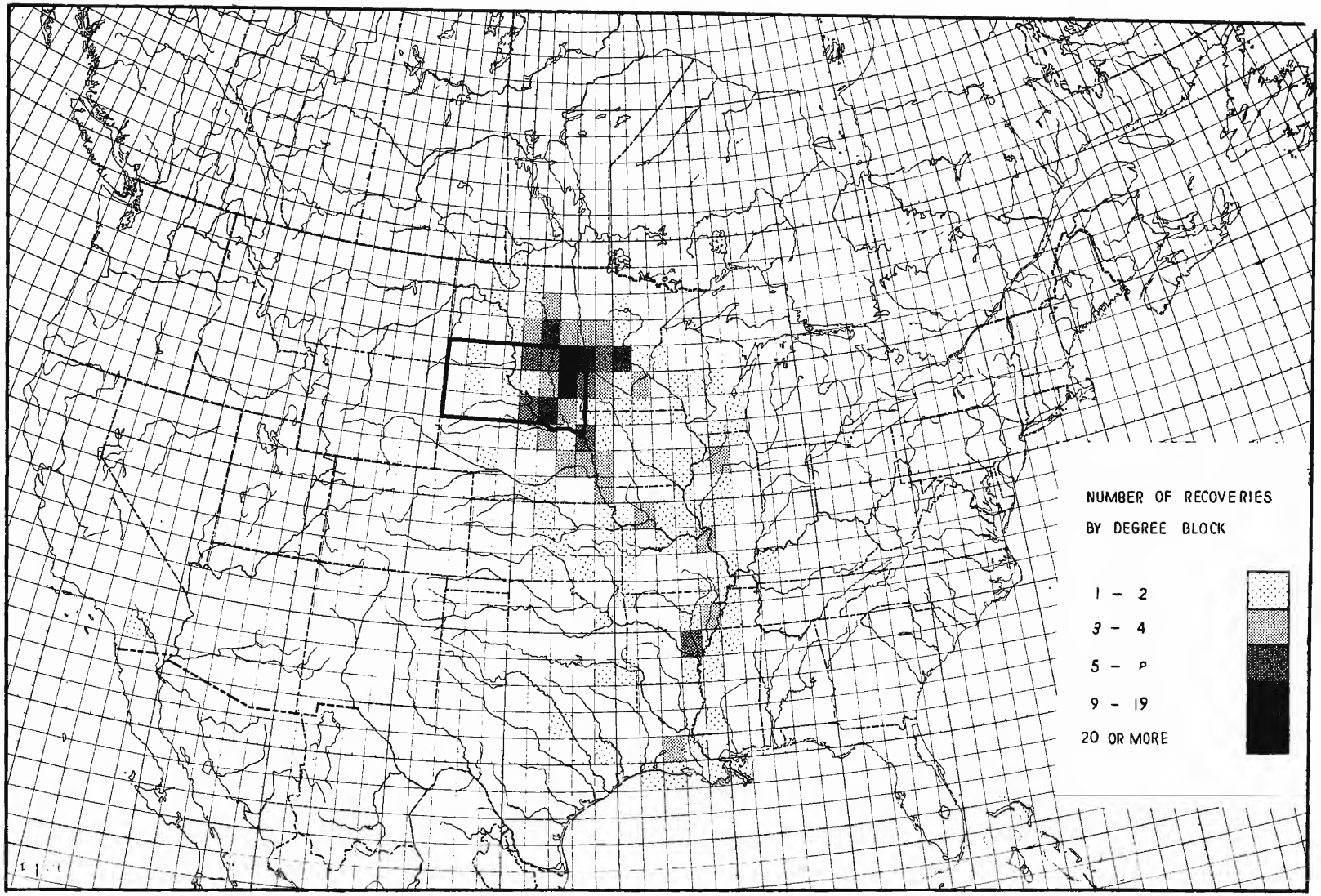

Figure 14.--Direct recoveries of local mallards from bandings in South Dakota.

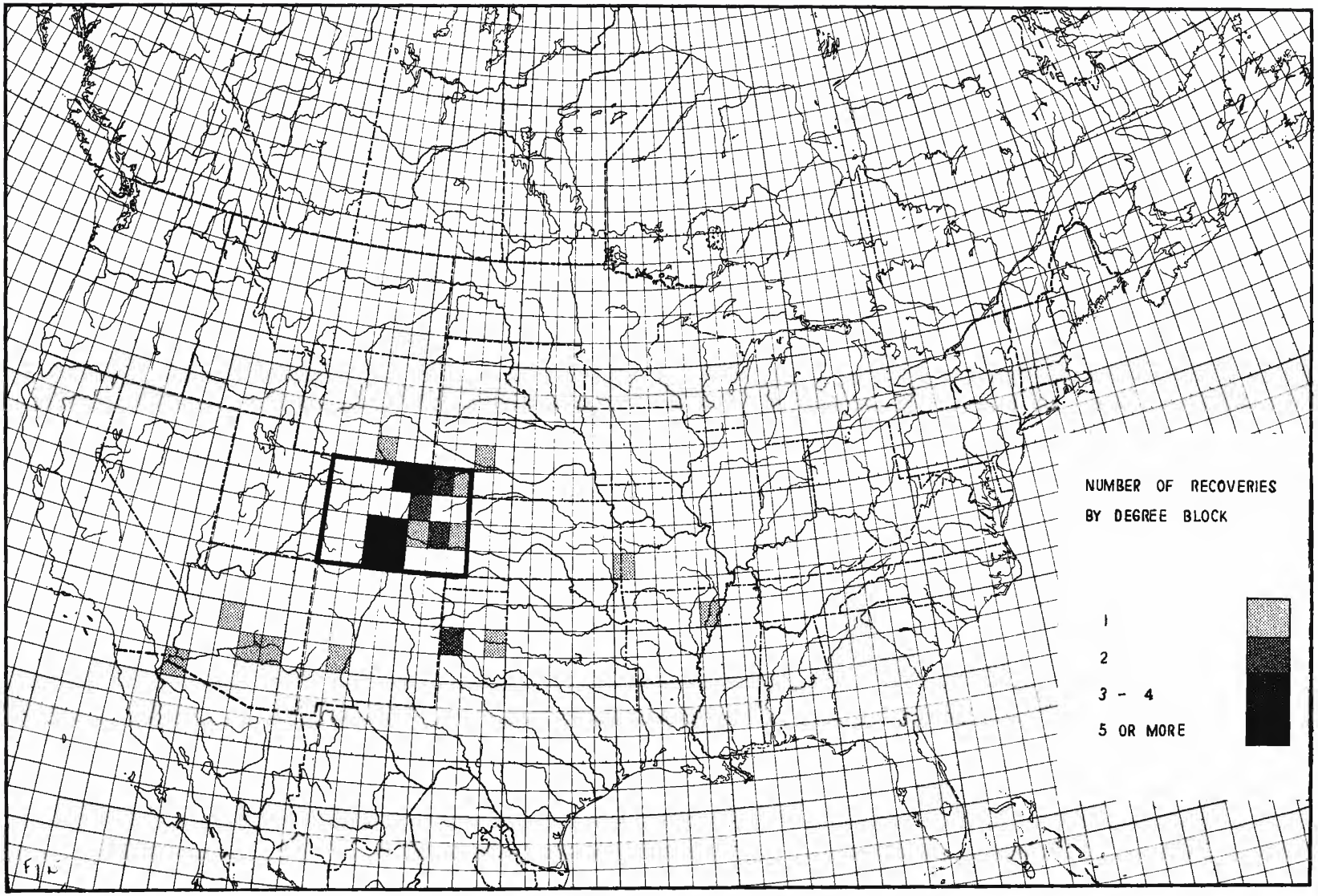

Figure 15.--Direct recoveries of local mallards from bandings in Minnesota.

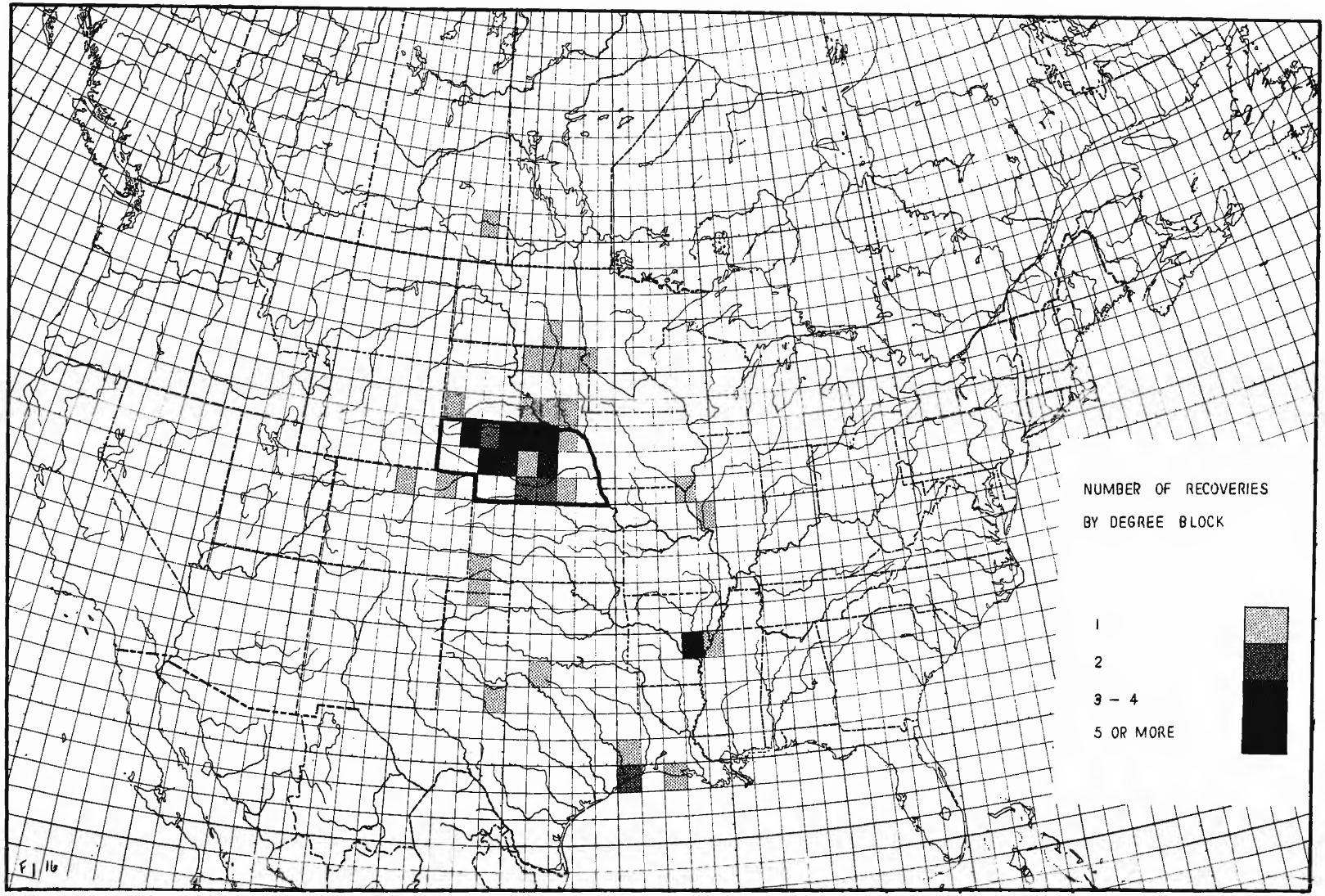

Figure 16.--Direct recoveries of local mallards from bandings in Colorado.

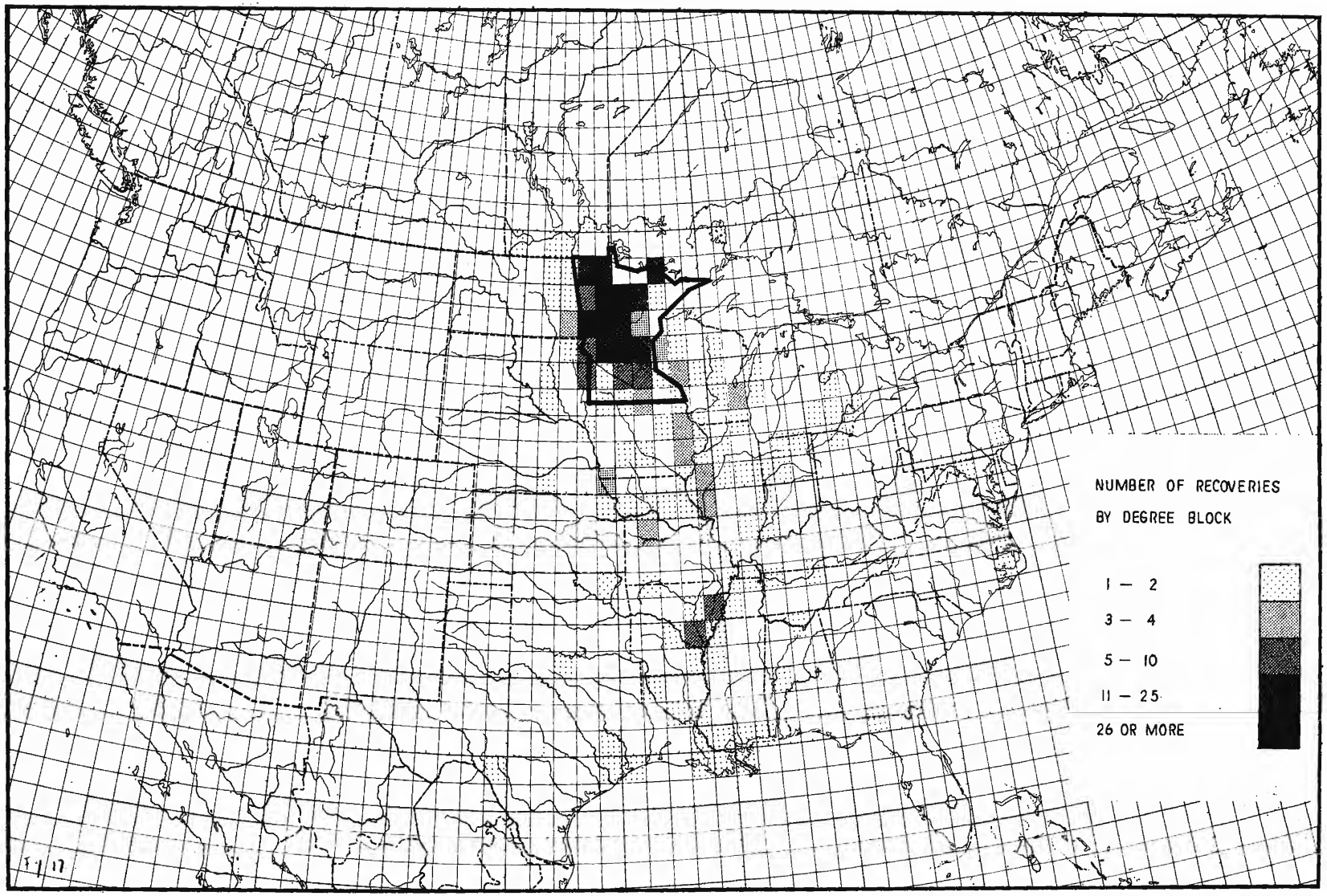

Figure 17.--Direct recoveries of local mallards from bandings in Nebraska.

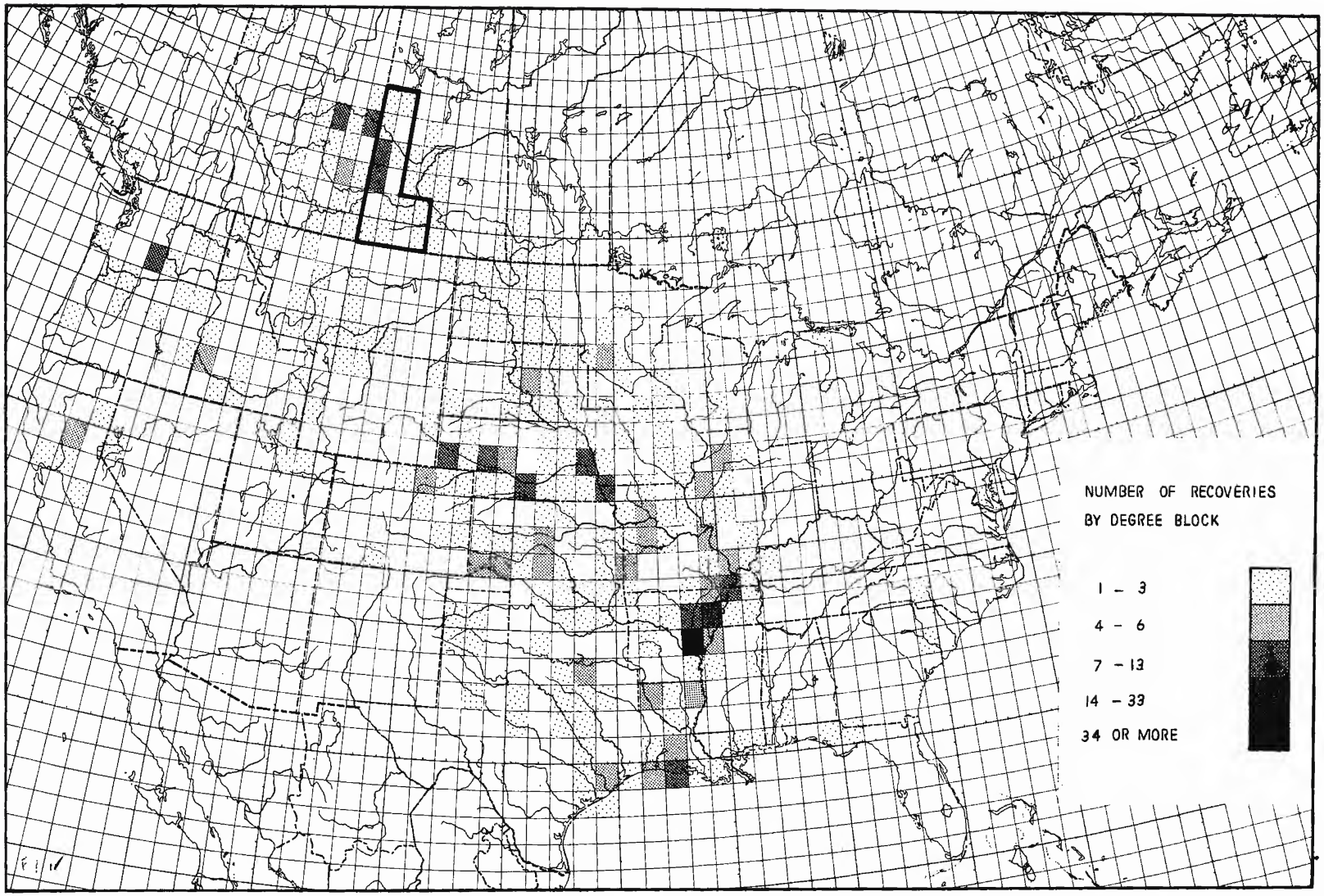

Figure 18.--Indirect recoveries of local mallard males from bandings in southwestern Saskatchewan.

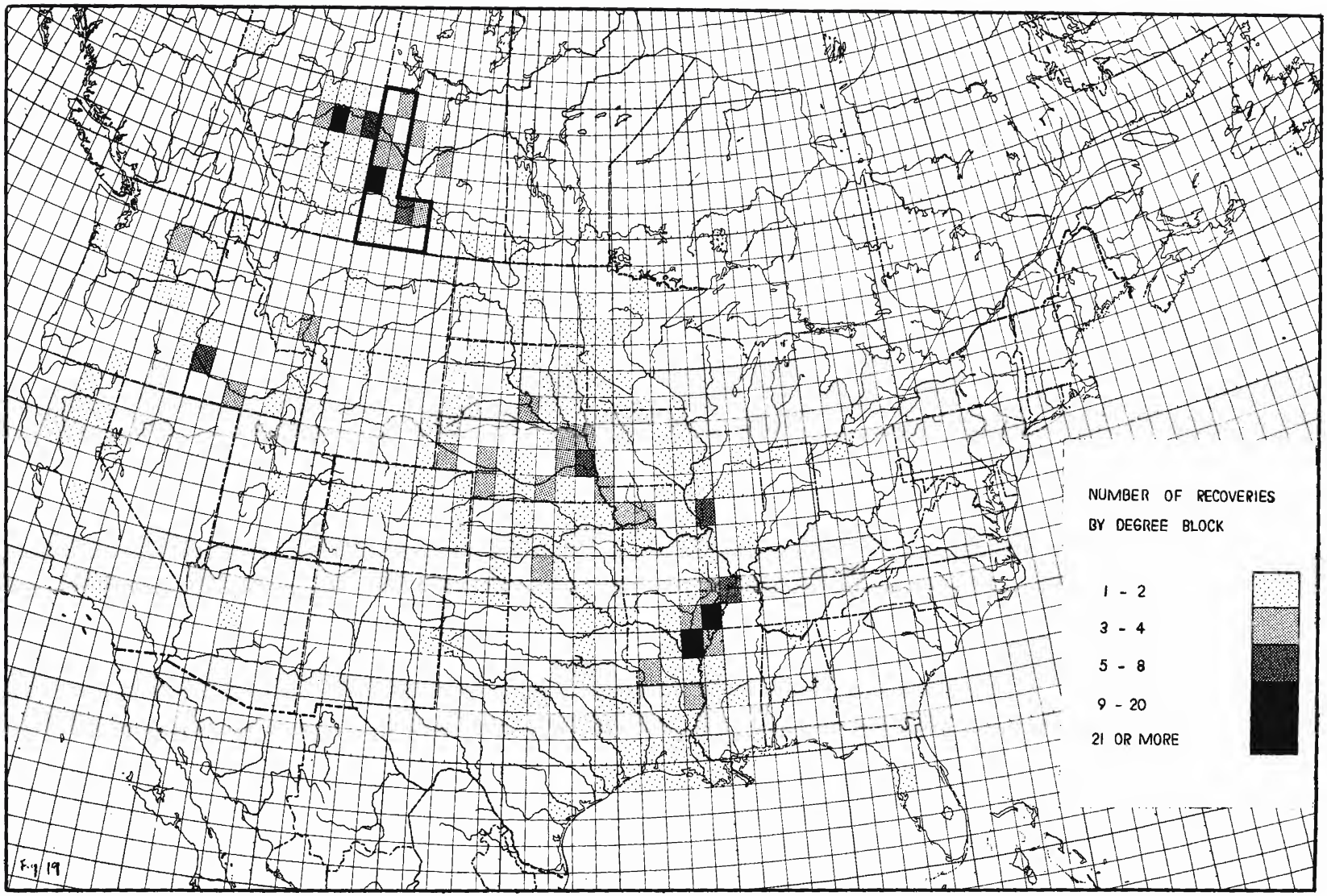

Figure 19.--Indirect recoveries of local mallard females from bandings in southwestern Saskatchewan.

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